AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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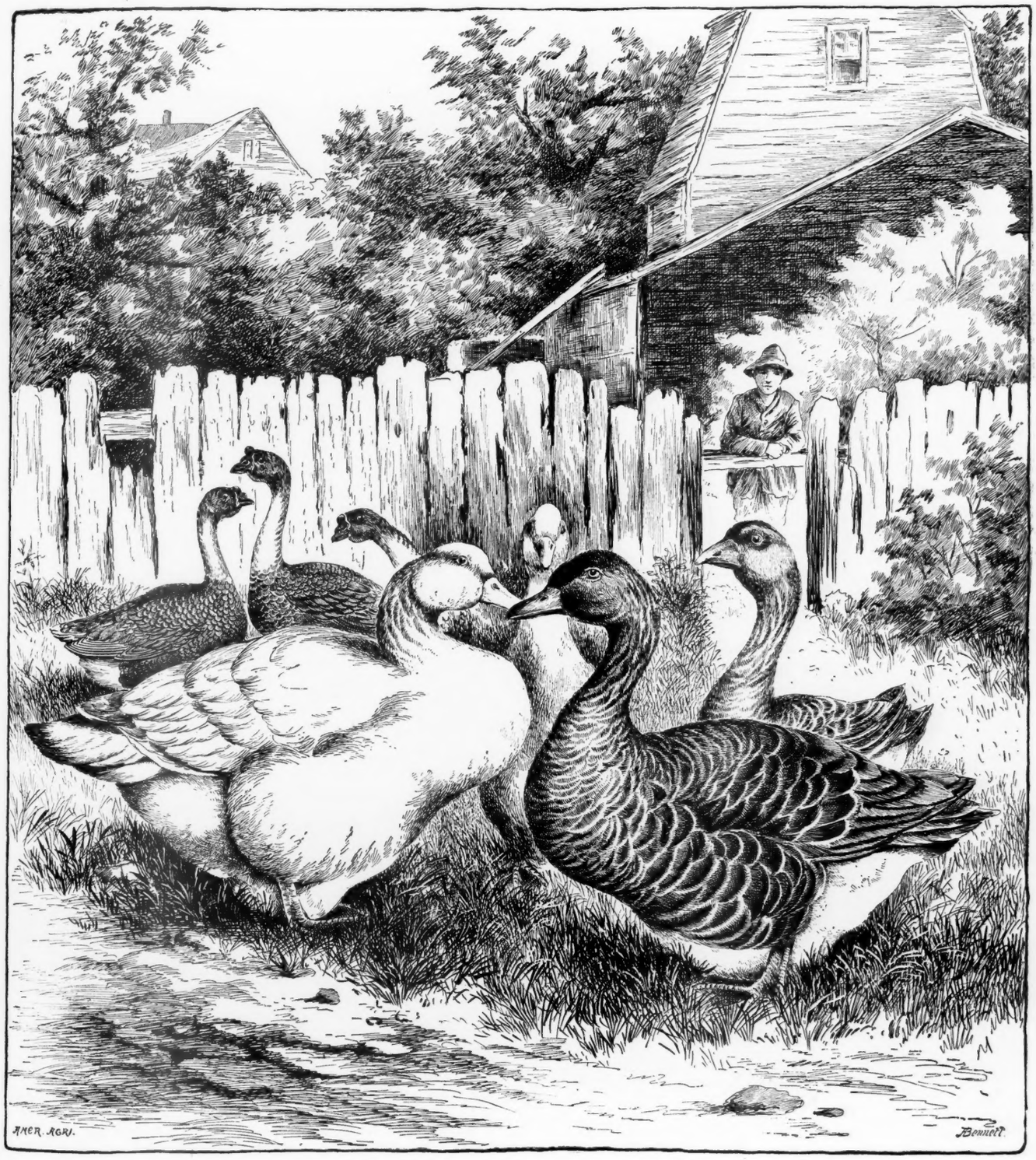

PROFITABLE BREEDS OF GEESE.

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RAISING GEESE FOR THE MARKET.

WILLIAM RANKIN, MASSACHUSETTS.

IT is often wondered why geese are not more generally raised by farmers. They possess quiet domestic habits, grace, elegance, and beauty, and the profit accruing from them makes no small addition to the income of the farm. The following hints are drawn from an experience of thirty years in raising and keeping geese. There are only three varieties of geese which need be considered, the African, Toulouse, and Embden or Bremen. The two varieties of China, Brown, and White, although hardy, are not large enough and do not make pounds enough of flesh for the early market. The writer has been quite successful with two crosses, those made by mating an African gander and Embden geese, and then crossing the young geese with a pure African gander. The most perfect geese are the pure-bred African, as they mature earlier and will lay more eggs while young, and they are very vigorous and hardy. It is almost always usual to raise all of them that are hatched. The Toulouse, though a large breed of geese, are not quite as hardy in this latitude. They are fully as good layers as the African, but will not take on flesh quite as fast when fatting for the early market. The Bremen, although not quite as large as either of the other two varieties, have the advantage of being pure white, with a yellow bill. When picked, their flesh is very white, and will sell readily, yet they are not as good layers as the others mentioned, seldom laying more than twelve or fifteen eggs to a clutch. The African, or Toulouse will lay from fifteen to twenty-five. Every gosling may be regarded as worth a dollar as soon as it is two days old. In the cross mentioned above an improvement is gained in the number of eggs, a marked improvement in the color of the flesh, and the green goose for early market, if well fatted, will sell very readily.

For food, the goose depends largely upon grass. With plenty of grass land to range over, it will need little other food. In winter I have my goose-shed so arranged that the flock may run under the barn in the coldest weather. They are fed some cut rowen, hay, or corn silage, with a little corn, or shorts and meal, care being taken not to get them too fat. If forced, they will begin laying before the snow and ice leave the ground, and the eggs will not be fertile. About February they begin to mate for the season. If any of the ganders have made their own selections from the flock, it is better to leave them to their choice. If not, the gander may be confined with three such geese as he is desired to mate with in a place by themselves, and usually they will all agree Should a quarrel arise, and the attempted mating not prove harmonious, place the disaffected goose with some other gander. After they are all properly mated, I mark the geese and gander by punching a hole in the web of one foot, marking each family uniformly, but the various families each in a different way, upon a different claw or foot.

For feed at this season I scald meal and shorts, with a little scraps, boiled potatoes, or turnips, and give them all they will eat, with a little corn once a day. The flocks must not run together, and they will not bear confinement like ducks, or hens. They want their own way, so drive one flock toward the pasture, one on one side of the house, one on the other, and one back of the barn, etc. Get some dry-goods boxes, filled with hay, for them to lay in, but it is best to let them think they are having their own way all the time. When they begin to lay, gather the eggs carefully, for if left they will chill. Keep them, if possible, in a room where the temperature is between 40° and 50°, and turn them every day. Having collected enough to set under a hen, give her from five to seven eggs, according to the size of the hen. Set as soon as practicable, for fresh eggs hatch better, and the goslings are more vigorous. I have hatched successfully in incubators, but rarely have eggs enough to fill a machine, and in the delay of waiting for enough, the eggs lose their vitality. Keep the goose laying as long as she will; then she will line her nest and want to sit. Break her up, and in about a week she will lay again. After she finishes that clutch, allow her to sit and hatch. Then let her and the gander run with the young, for both will guard them with care and the goose grow strong again.

As soon as the goslings are strong, put them in a little yard, with the hen, where there is green grass and a sunny slope, and they will soon begin to pick at the grass. Give a little meal and shorts mixed, of which they will eat every day. Furnish them a dry warm box if the weather is cold, and in two or three days a larger run, and then let them go, and they will "come home to roost." If they have grass enough, and some food every day, you can almost see them grow. Give them all the food they will eat, and all the grass, until the flight feathers grow out as far as the root of the tail, and then inclose them for fatting. For this a dry situation is required, where no water will stand, and no mud. A small yard fifty feet square, with some shade, will be large enough for seventy-five goslings.

Do not frighten them. Be as gentle with them as possible, and keep them quiet. I have a large boiler that holds about two barrels. I fill this with water, and when it boils stir in the meal, mixing until quite firm, and adding about fifty pounds of beef scraps. The young geese are fed all of this mixture they will eat, and only water enough to drink. Put in their inclosure some pieces of rotten wood, for which they will find a use. It takes me from seventeen to twenty days to fit them for market, as some will fat easier and quicker than others. It is important with the early birds to get them in the market before July 4th, as we can get twenty-five cents per pound wholesale before that time. When the goslings are fit for market, go into the pen, select the best, and take them to the picking room. Bleed through the mouth about a minute, and then strike a sharp blow with a short oak stick. Beginning at the breast, remove the feathers as quickly as possible, picking one joint of the wing and half of the neck. Put them in a barrel of cold water, and let them remain until night. Then change the water, washing all the blood from the bill, and put some ice in the clean water. Ship as early in the morning as possible. I have usually sold to Boston markets, but sometimes ship to New York.

The profit of this business is largely dependent on the price of grain, etc. Each goose should average twenty goslings per year. Allowing that the goslings average ten pounds, the produce from each goose would be 200 pounds, and I have sold at an average price of twenty cents per pound for several years, in the Boston market, which would give $40 per goose. There is a great difference in geese for laying, but I select with care, and only save the best layers. After a few years a man ought to make his flock average thirty eggs from two clutches. Three years ago I had one pair that ran alone. The goose laid fifty-one eggs. I saved, marked, and set the eggs. Thirty-eight of them hatched, two of the goslings were killed by accident, and one died. I took as good care of the remaining thirty-five as possible, fattened, killed, and shipped them to Boston, and they returned me $81.47. I received twenty-five cents per pound for the early ones, twenty-two cents for the next lot, and eighteen cents for the last. Such results are possible, but they are not often realized. Success will depend, in a great measure, upon experience.

[Our frontispiece portrays the three leading breeds of geese. A trio of Africans is seen on the left hand, a pair of Toulouse to the right, and a pair of Embden in the center.]

THE ECONOMIC VALUE OF GOOD ROADS.

WILLIAM M. KING, DISTRICT OF COLUMBIA.

There is no economic question of more importance to the American farmer than that of good roads. No branch of public work is so neglected, although as an investment there is none that pays the people at large so well as the maintenance of as perfect a roadway as possible. Both State and national aid are desirable, but the idea of State aid seems to meet with the greatest favor. The people most interested must take energetic measures to awaken enthusiasm on this vital subject. It is only by the earnest discussion of the economic bearings of the subject that the skeptical can be aroused from their apparent lack of interest to enthusiastic action. Without the presentation of facts and figures the enthusiasm, which is so essential to progress, cannot be aroused.

The very general complaint of hard times arises in part from the existing condition of our public highways. When the roads are well nigh impassable, then it is that the prevailing scarcity in the leading city markets forces up the prices, and for the lack of good roads the farmer is unable to supply the market. Roads, to be of the greatest value to the farmer, must be kept in such condition that he can market his crops during those seasons of the year when he has the most leisure from pressing farm work, or when the highest prices prevail. The loss which frequently results when

the farmer is cut off from all markets because the common dirt roads have been converted by the open, wet winter into almost impassable morasses exceeds, in many cases, the amount of his annual taxes. There never has been so much need of well-directed coöperative effort, on the part of the people of the townships and of the towns and cities, as now. It will be easier to secure the passage of a macadam law now, than it will be in ten years. Capital is on the lookout for localities in which toll turnpikes can be built. Why pay six or seven per cent., annually, in tolls for the use of a pike, and three per cent., or more, in addition for keeping it in repair, merely because we cannot agree to work together and build our own roads on some equitable coöperative basis.

Prof. Lewis M. Haupt, who is at the head of the engineering corps of the University of Pennsylvania, recently made the following graphic statement of the relative progress we have made in common road-making as compared with the results attained in the construction of our great railway lines: "While we have built our magnificent roads of steel across and up and down the continent, over which we ride at the rate of a thousand miles or more a day, and transport millions of tons of freight, the common roads at our doors, leading to our railroads, remain much as they were a century ago, and the farmer still plods along, his wagon nearly hub deep in the mud, between the farm and the station, taking half a day to make the trip that should be made in half an hour."

It has been well stated that the excessive wear and tear of wagons and teams destroys nearly all the profit that otherwise might be derived from a crop, and the delay and vexation attending such wretched modes of transportation are extremely trying to the temper and patience of the cultivators of the soil. We complain of the high prices charged by the railway corporations, while in point of fact the greatest expense is that required to convey our produce over bad roads to the nearest station. Poor roads cost the husbandman altogether too much. It requires three or four horses to haul to the nearest market what two could easily haul on any good road. The fact is, we are supporting thousands of horses to drag loads through holes that ought to be drained and filled. We have the unremitting inconvenience of bad roads, and actually pay a premium for them. Poor roads are invariably expensive, and good ones a sure source of profit.

It costs less to properly care for a mile of good macadamized road each year than it does to keep a horse. If the keeping of a horse costs one dollar per week, and the services of the animal can be dispensed with by the building and subsequent care of a good road, there is a clear saving of this amount annually which, if used in road construction and repairs, would cut down expenses in other directions, enhance the value of our farms and add to the attractiveness and comforts of our homes. There are no public works whose benefits are more evenly distributed among the masses of the people than good roads, and yet there are none in this country for which the taxes are more grudgingly paid.

The most common, crooked, unworked roads in the most obscure localities are, nevertheless, the arteries through which a large per cent. of our agricultural products finds its tedious way to the market. Their inferiority is a reflection upon the wisdom of State and national legislation. Road making has heretofore received so little attention that road engineers are by far too uncommon. Good roads, that is, the best for the cost, may, can and should be built without unnecessary delay. There is no question as to the resulting profit. They are a necessity. The meandering dirt road, unpainted houses and dilapidated fences are inseparably connected. Carelessness in this direction runs through a whole neighborhood like an epidemic. It is contagious. But, as soon as a turnpike with its smooth and comparatively straight roadway is built, there comes a change for the better. The house is repainted, the fences repaired, and neatness in the home surroundings at once takes place. Smooth, hard roads are a financial blessing, and tend to promote the educational and social advantages of the community. Purchasers of farms would seek such pleasing neighborhoods, and lands would sell quicker and at higher prices; education and refinement, in connection with the increase in the attractions of home, would give a higher position to life in the country, and a greater number of our most enterprising young men and young women would prefer a refined agricultural home to the turmoil and anxiety incident to town or city life. Good roads tend to nurture sociability and friendly, profitable intercourse between neighbors and neighborhoods. When the roads are poor, a farmers' club or grange is always at a disadvantage, and a full attendance is the exception, instead of being, as it should be, the rule. Good roads are needed far more than costly country buildings. Good roads are due every American citizen, and each should work and vote for good public roads, and, if needs be, demand that they be built and properly cared for. It will pay to be liberal in the expenditure requisite for good public roads. Good roads are a permanent advertisement of the character and enterprise of the people. No better legacy in material or lasting form can be bequeathed to posterity, than good public highways. If they are properly built, and properly kept in order by the present generation, they will stand as a perpetual object lesson, showing to succeeding generations the good sense and good taste which characterized preceding ones. Good roads are intimately connected with our prosperity as a nation.

TWO DAIRY POINTS.

JOHN GOULD, OHIO.

The rapid strides in dairying within recent years makes it imperative that the farmer who relies upon his dairy for support shall be active in brain, as well as deft of hand, else he is distanced by more observing and painstaking men. One of the first things to be looked after is a cow that will give a fair flow of milk ten or eleven months of the year, or to within six weeks or a month of coming fresh. The six months milking cow must give way to a more persistent milker. It does not pay to pasture a dry cow four months in the summer any better than to let her go without return for feed a corresponding length of time in winter. The "new era" in dairying has so revised the system of ration production that it is doubtful if pasture grass is any cheaper than the winter stores of feed, so that even if summer prices are low, the cow, to pay for her keeping, needs to bridge over as much as possible of the long period of non-production which was once deemed essential to her well-being. One reason why the cow should be a persistent milker is that the market is not satisfied with other than freshly-made goods, and pays top prices for no other. Grass butter made in June is no longer sold at high prices in November, but a constant supply is called for. The separator has appeared upon the scene to answer a new demand—a machine to take all of the fats out of the milk any day of the year, without regard to the time of lactation. When this milk is creamed by centrifugal force, with only a minimum of albumen and casein in it, and is properly ripened and churned, the flavor is maintained, and one hears little nowadays about such butter being low flavored, "because the cows are long in milk." The farmer, to get these long, persistent milkers, must raise them. The habit of persistent milk production is partially hereditary, and partially the result of habit—training the heifer to keep up the flow. The money is not now made on a cow that gives a river of milk for a few months, and goes dry the larger part of the year. The demand is for a cow that will calve in October and give an average of twenty-five pounds of milk a day for 315 days. The day for cow-beef to count as a factor has passed. To be profitable, the cow needs to put all of her food into milk, and do it for year in and year out, and when at last "milked out," let the owner be content to give her remains decent burial and provide beef from other quarters.

The unusual activity displayed by our dairy inventors along the line of centrifugal power in creaming milk, indicates that there is a demand on the part of butter makers for a machine that does uniform and close work the year round, not merely to completely separate the cream from the milk while the cows are upon grass, and then fail for the balance of the year of getting much over eighty per cent. of the butter fats out of the milk. In these days of exceedingly close competition, every pound of butter saved in the creaming process over older and supposed unimprovable methods, is twenty-five cents added to profits. The idea that what was lost in the process of butter making was saved by the pig, does not hold good, as a pound of oil meal with skim milk has a feeding value about equal to the same weight of fat. While the invention of the cold, deep process of milk-setting was a great advance, investigators like Drs. Babcock and Cook are finding that while the milk of individual cows may be perfectly creamed, that of other cows cannot be, and when it comes to a dairy cow over six months in milk, the losses begin to mount up, and the centrifugal machine will take out from a half pound to a pound and a quarter more butter fat from each 100 pounds of milk than can be obtained by gravity setting. This is plain. If, by the use of a good centrifugal machine, the 275-pound butter cow can win an extra credit of forty pounds of thirty-cent butter, then $12 to each cow would be a fair profit on an investment of $125. The experiment stations, dairy schools and butter conferences have a large field of study and experiment

before them the present year. It would seem that the dairy industry is not only exhibiting a great evolution, but is also on the verge of a revolution in methods and practice. The demand of the market is constantly for fresher goods; this can only be accomplished by shortening the time between the cow and the butter package, and lessening the chances for detracting influences. The separator shortens the time of cream extraction. The "starter" abbreviates the time of ripening the cream, and working over and salting the butter in the churn, abridges the working-over part, while the express company annihilates distance! Will the butter maker of the next century improve very much upon this?

THE IMPROVEMENT OF WILD GRASSES.

PROF. CHARLES E. BESSEY, EXPERIMENT STATION, NEBRASKA.

It is not likely that we have found and brought under cultivation all the useful wild grasses. It is very likely, on the contrary, that there are as good grasses awaiting cultivation and improvement as any which have hitherto been brought under cultivation. We must not forget that Timothy, Red Top, Orchard grass and Kentucky Blue grass were once wild grasses only, and that they were at some time brought from the wild state into cultivation. Originally (and by that we are not to think of a long time ago) there were no "tame" grasses. Thus Timothy "had escaped the notice of agriculturists" in England, until about one hundred and thirty years ago. About the same may be said of Orchard grass, Red Top and Kentucky blue grass. In fact it is scarcely more than a hundred years since every grass, now commonly cultivated in our meadows, was as wild as Buffalo grass, Grama, or the Wheat grass of the plains. Now what has been done can be done again. If we have succeeded in bringing some grasses from a wild state into cultivation, it is probable that we can do so with others. It is the purpose of this article to suggest how this may be done, to the end that there may be a greater variety of cultivated grasses to meet the demands of the many different conditions as to altitude, latitude, temperature, rainfall and soil, to be found within the boundaries of the United States. Dry land grasses are much needed.

In the attempt to improve a wild grass it is, first of all, necessary to know whether the species is adapted to the particular locality. It is always safer to make trial of native species. In the second place, care must be taken to determine whether or not it is readily eaten by domestic animals. It is not enough that a hungry animal will eat it; it must be relished by even a well-fed beast. Thirdly, it must be capable of being grown successfully under cultivation. It is not every grass that does well under wild conditions that can be depended upon to do correspondingly well under cultivation. On the other hand, some grasses, which in the wild state are of relatively small and feeble growth, under the better conditions afforded by cultivation become strong and robust. This matter must be determined by some actual trials. A most important question, practically, relates to the ease of propagation. A grass which does not seed abundantly, or whose seeds are difficult to harvest, or which are difficult to handle in sowing, cannot come into general favor. The seed production may be improved.

If now these questions have been determined favorably for a particular wild grass which has a promising look, and which the chemist finds to have a fair or good nutritive value, the process of improvement may be taken up by applying the well-known principle of selection. Let the experimenter select the seeds from the best-grown specimens to be found growing wild. These should be planted with great care, and for convenience should be in pretty close rows. When these plants have reached maturity, select seeds again from the best plants, and so continue for a number of years until the size and quality, desired, are reached. The greatest possible care should be taken to select only the very best, and to rigidly exclude the seed from plants showing undesirable qualities. By following this plan for a few years a marked improvement will invariably follow. The improvement by selection may be greatly hastened by high culture. The experimental plats should be upon good strong soil of the kind best adapted to the grass under experimentation. Within certain limits the richer the soil the better it is for the purpose of hurrying forward the work of improvement through selection. Care must be taken not to overdo this so as to produce large and soft stems, with too succulent foliage.

It is difficult to suggest particular species for trial in any locality, but the following list may be useful in the way of general suggestion: Switch grass (*Panicum virgatum L.*), Big Blue Stem (*Andropogon provincialis Lam.*), Bushy Blue Stem (*Andropogon nutans L.*), Mountain Timothy (*Alopecurus pratensis L. var. alpestris*), Wild Ribbon Grass (*Phalaris arundinacea L.*), Muhlenberg's Grass (*Muhlenbergia glomerata Trin.*), Large Bent Grass (*Agrostis grandis Trin.*), Wild June Grass (*Kœleria cristata Pers.*), Buffalo Bunch Grass (*Festuca scabrella Torr.*), Wheat Grass (*Agropyrum glaucum R. & S.*). Many more might be mentioned, but these will serve to direct attention to the promising wild grasses, especially in the Western regions.

HOW TO GROW EGG PLANTS.

E. S. MILLER, LONG ISLAND, N. Y.

Young plants ready for planting out are now so easily obtainable from seedsmen and plant growers that it is hardly worth the trouble to raise them for the home garden. About twenty-five plants will furnish enough fruit for an average family. When ready to plant out, the ground should be well prepared. Egg plants require a rich soil and plenty of manure well worked into the ground in the immediate vicinity of the plants. I do not think they can be injured by too much manure, if it is old and well rotted. I have used as much as half a bushel to a plant, and felt paid for the outlay in the vigorous growth and size and quantity of fruit. Saturate the soil with water and handle carefully so as not to lose any soil from the roots. In transplanting, firm the soil about the roots leaving it loose on the surface. The after treatment may be the same as for other vegetables. The greatest drawback to growing egg plants is the potato bug. The mature bugs must be picked off daily and the eggs destroyed as much as possible. The larvæ can be kept in check by the use of Paris green, care being taken not to use it too strong, as it will easily burn the foliage. Though a member of the potato family, the egg plant is more tender. The nimble flea is very destructive to the tender plants when first set out. The best remedy for this troublesome insect is tobacco dust, a mixture of tobacco dust and Paris green, one part of the latter to three parts of the former; dusting it on the plants while the dew is on, will answer for both fleas and potato bugs. The operation must be often repeated to be successful.

There are several varieties of egg plants in cultivation. The early ones have small fruits, which are rather seedy. The variety generally grown, and by far the best is the Improved New York Purple. The product of different strains of this differ very much. That strain having very thorny stems and leaves, is considered best by professional market gardeners. The fruit is fit for eating while the skin is yet a rich velvety purple. When the seeds mature, the color fades to dull purple with streaks of green.

TURNIPS, CLOVER AND TIMOTHY.

JOSEPH SMITH, MICHIGAN.

Having failed several times to get a good stand of grass by sowing the seed with wheat, as is usually done here, I plowed the land as soon as the wheat was off. As fast as it was plowed the land was rolled and brought into as good condition as practicable. I then mixed a pound of flat turnip seed with the clover and timothy necessary to sow an acre, and sowed the land just as I would if I had only sown grass seed alone. I then rolled the seed in without any harrowing, and, although the weather continued remarkably dry, the seed came up well, even on the lightest of the soil. Just before freezing up, so large had many of these turnips grown, I could not resist the temptation to bless myself at the expense of the land, so I took off about seventy bushels of turnips to the acre, and stored them away for early winter feeding. Even then the remaining turnips looked like a mass of green, and when the frosts struck the leaves, they wilted down, not as a blanket, to smother out the young plants, but as an air-admitting mulch protecting the young and timothy.

When the first light snows of winter struck that field, the turnip tops gathered the feathery covering for additional protection, and, when the sun melted the snow on other fields, here it seemed loth to depart. In spring, when I visited the field and saw with satisfaction that the turnips were decayed and the clover was feeding upon their remains, I felt I had made a discovery that would enable me to become master of, instead of being mastered by, similar conditions. I do not remember that I have ever cut a heavier growth of grass on any land than I did that year on this field. Of course I had some wheat, and occasionally a stalk with turnip seed in my hay, but, with the exception of tempting mice to the bay of hay, this was of little detriment.

AN ATTRACTIVE ROCKERY.

Among tall pines, in a secluded spot on the grounds of Mr. P. B. Follensbee, Essex Co., Mass., is located an extensive rockwork, a view of which is presented herewith. The rocks and stones used in it were near at hand, and have been brought together mainly to clear them off the land, thus combining a double purpose. A study of the picture shows at once that the owner of the rockery has not only displayed correct natural taste in its construction, but that he is also intimately acquainted with the character and requirements of the various kinds of plants adapted to similar locations and conditions. Since the photograph, after which our illustration has been engraved, was taken, most of the large rocks have become covered with *Ampelopsis Veitchii*, and the arch has been artistically lined with a narrow border of English ivy. Among the plants used are many which retain their foliage through the winter, such as *Arabis alpina*, which starts easily from cuttings, and lasts for many years. Planted in narrow stone pockets it will soon cover a large surface with a mat of ever-green leaves which will produce a mass of snow-white flowers in early spring. The double, yellow Celandine renews itself frequently from self-sown seed, and continues in bloom throughout summer. Sempervivums fill many places where nothing else will grow, and Sedums, with their pink, white, and yellow flowers require but very little soil. Trailing Nasturtiums sparkle among the foliage of other plants as they droop over the edges of rocks. On the upper part of the rockery many kinds of herbaceous perennials find a congenial home. Cannas, Phlox, wild Asters and Golden-rod, Salvias and Marigold, Spiræas and Pæonias, in many varieties, grow quite luxuriantly.

The foreground on the right is carpeted with Vincas, Lysimachias, Crocus, Daffodils, etc. On the rear of the rocks, shaded by trees, are Rhododendrons, Kalmias, Magnolias, Yew, and Holly. Among the smaller-growing plants the principal ones are *Linnæa borealis*, Trailing Arbutus, Andromedas and *Daphne Cneorum*, one of the very best hardy, low-growing evergreen shrubs, covered in early spring with its fragrant, pink flowers some of which appear as late as November. Under a tree at the left is a pile of rude stone implements, relics of an ancient race, which were found in the neighborhood, and which add an historic value to the locality.

ARTISTIC ROCK WORK.

BLACKBERRY INSECTS.

According to Professor Smith, there are three species of insects, at least, that take part in the depredations suffered by the blackberry growers in New Jersey. There is the red-necked cane borer, the parent of which is a beetle a third of an inch long, found during bright days in late May to July, upon the upper surface of leaves. The infested canes show galls of considerable size. As a remedy, the canes should be cut away below the galls, and all cuttings should be burned, which will prevent the maturing of the beetles. Growers should coöperate in the work, so that one person, through neglect, may not be a nuisance to his neighbors. A second enemy is the crown borer, the parent of which is a medium-sized moth. This makes its appearance in August, and quickly deposits its eggs in the canes near the surface of the ground. For this the remedy is the knife and burn heap as mentioned above for the first enemy. There is a giant root borer, that lives in the large portions of the main root, for which there is no remedy but the destruction of the infested plants. Experiments with fungicides are of very little value with such enemies as these named. Let the blackberry grower keep a close watch of his canes, and cut out and burn the borers as galls form, or when flagging life suggests that something should be done. If there are wild blackberries growing in the vicinity they should be examined and treated as above. Abandoned gardens and old fence corners are often fertile breeding places for these insects.

THE FALL CROP OF POTATOES IN THE SOUTH.

W. F. MASSEY, NORTH CAROLINA EXPERIMENT STATION.

My remarks upon the late crop of Irish potatoes in the South in a recent number of the AMERICAN AGRICULTURIST, have brought me a number of letters from persons who want to know more about the details of the culture of this crop. A correspondent from Tennessee states that in his section they are much interested in this matter, as they very seldom succeed in getting any good results from the late crop.

It has only been within a few years past that the conditions necessary for success have been fully understood. Years ago we all assumed that because the late crop is planted in hot weather, the potatoes should be planted very deep, so as to secure moisture. The result of this deep planting, almost invariably, was a very poor stand, the potatoes largely failing to grow. A few years ago, in walking over a field in late summer from which a crop of potatoes had been dug and marketed in June, I noticed a great many volunteer plants growing from the small potatoes left in the ground. The land had been smoothly harrowed for fall grain, but not yet sown. The growth of these volunteer potatoes attracted my attention, as I, like many others, had been trying to devise a plan for getting a more uniform stand of the late crop. If some of them grow so well, why do not others, I asked, and proceeded to investigate. I soon found that every potato that was growing was immediately on, or just under, the surface. Many were almost out of the ground, and dark green from the effects from the sunshine. On turning a few furrows in the land, I brought to the surface many other small potatoes, sound, plump and unsprouted, and some decayed ones. So I began to reason that, doubtless, in digging the crop unripe for the early market, many of the small tubers were so immature that they decayed, and others, buried deeply in the soil, were not in the best conditions to favor a quickly renewed growth. I then began to experiment and to compare the experiences of others who were working in the same line.

In my first experiments I allowed the small potatoes of the early crop to lie exposed to the light until well greened, and then planted them and covered them deeply. The result was a rather poor stand. Other tubers were planted and barely covered with soil. The result was a much better stand, but still many gaps, where the potatoes proved to be rotten. I became satisfied that shallow covering was best, but did not unfold the true plan until, in a discussion in a Farmers' Institute, it was stated that some growers were bedding their potatoes, and sprouting them before planting. I at once saw that this was the solution. And now for several years I have not failed to secure a good stand.

We take the small potatoes, the cullings of the early crop, spread them out to green awhile, and then place them in a single layer on a bed of mellow soil just so as not to touch each other, and cover them about an inch or two with light sandy soil. There they remain until planting time, which is here during the first half of August. By this time all the potatoes that will grow in time for a crop will be found to have started their eyes. These are the only ones we plant. In planting, we plow a deep furrow, and drop these potatoes, uncut, and then cover them very lightly in the bottom of the furrow. As growth proceeds, the deep furrow is gradually filled in around the growing plants, and all cultivation thereafter is as flat as possible. No hilling should be done, as is practiced with the early crop, the object being to conserve moisture. Treated in this way, the yield is about as certain as that of the early crop, and enables us to grow potatoes that will keep unsprouted all winter, and will furnish the most vigorous seed for planting the early crop. Quite a business is now springing up in the sale of these late grown seed for early planting northward.

It has generally been assumed by growers that deterioration would set in rapidly if the process is carried too far, and that it is necessary to get enough Northern potatoes annually to produce seed for the late crop. But, quite recently, a gentleman in the Southwest informed me that his late crop, from an early crop raised from the previous autumn's seed, was superior to that raised from seed grown from Northern potatoes that season. We are now inaugurating experiments in this line, and propose to grow, annually, a crop from our own seed, in competition with seed produced the previous season from Northern seed.

I am inclined to think that much of the deterioration of potatoes in this climate comes from growing the crop from seed weakened by sprouting, and rubbing off in winter before planting, and that a practice which will avert this weakening of the vital forces in the tuber, will better maintain its productiveness. Potatoes dug the last of November, and planted again in February, will certainly grow with more vigor than those dug in late summer or early autumn, and rubbed off once or twice in winter. So it may be possible that Southern-grown seed potatoes may be sought for at the North.

AMOUNT OF WORK DONE IN PLOWING AN ACRE.

A. M. TEN EYCK, WISCONSIN.

In the latter part of September, 1891, an experiment was undertaken, as a part of the work of the students in Agricultural Physics in the University of Wisconsin, under the direction of Prof. F. H. King, to ascertain the amount of work done by a team in plowing an acre of ground. The plow used in this experiment was a two-horse sixteen-inch Johnston & Fuller walking plow, and was in good running order. The two essential factors which were to be determined were: 1, The draft, and 2, the width of the furrow. The latter is easily found by direct measurement, but the former and more important is determined with somewhat more difficulty. The instrument which we used to determine the draft was the Osterheldt & Eickemeyer dynamometer. Its essential parts are two strong springs, whose resistance when stretched certain distances has been computed, and an index which is so connected with the springs that their stretching causes it to move and mark, on a scale, the force in pounds which produced the motion. This instrument is fixed as the connecting link between the double trees and bridle of the plow. The whole pull which the horses exert is thus communicated to the springs. In connection with the instrument is a tape measure one hundred feet long. At the start this is wound up, its end being joined to a cord or small chain which is fastened to a stake behind the plow. This tape runs out as the plow moves, causing the reel, in which it is coiled, to revolve. This reel is so connected with the registering part of the instrument, as to cause it to work only while the tape is running out, viz. while the plow moves one hundred feet. The average draft for one hundred feet is thus registered by the index. Hoof pressure is omitted.

The draft was determined, in the manner stated above, for several consecutive trials of one hundred feet each, on two different pieces of ground, corn stubble and clover sod. From the figures thus obtained, the average draft was found to be 365.25 pounds for the corn stubble and 535.7 pounds for the clover sod. The average width of the furrow on each field was 14⅜ inches. The average depth for the corn stubble was 5.57 inches, and for the clover sod 4.87 inches. With these data, we can now calculate the amount of work required to plow one acre of either of the fields mentioned.

First, taking the corn stubble, we find that if we consider our acre a strip of ground eighty rods long and two rods wide, that, to plow the acre, it will take twenty-seven furrows 14⅜ inches wide and eighty rods or 1,320 feet long. To turn these furrows, the three horses must travel 1,320x27, or 35,640 feet, and the average draft being 365.25 pounds they must do 35,640x365.25 or 13,017,510 foot-pounds of work. In the same way, with the average draft of 535.7 pounds, we find that the amount of work done in plowing an acre of clover sod is 19,092,348 foot-pounds. Thus it took 6,074,838 foot-pounds more work to plow one acre of the clover sod than it did to plow one acre of corn stubble, although the corn-stubble furrow is one-half inch deeper than the clover-sod furrow. It requires a certain number of foot-pounds of work to plow an acre in one of these fields, no matter how rapidly or slowly the work is performed. But suppose that the rate is such (and this was practically the case) that two acres are plowed in one day of ten hours, or one acre in five hours; then, if we divide the whole number of foot-pounds of work done in plowing the acre by the time it takes, expressed in seconds, we will have the actual amount of work which the team does per second. Computing these results, we find that in plowing the corn stubble, the team does 723.2 foot-pounds of work per second and 1,060.7 foot-pounds per second in plowing the clover sod. Each horse, in the first case, does 361.6 foot-pounds per second, in the second, 530.35 foot-pounds per second; 550 foot-pounds per second is considered to be the maximum amount of work which the average horse can do, and is called a horse-power. Reducing the foot-pounds to horse-power units, they are found to be .66 and .96 of a horse-power respectively. Thus we see that in both cases the work which the horses do is not above that which they are theoretically able to bear on a firm roadway, yet in plowing these mellow fields it was found to be very hard work for two horses, and three were finally put on the plow.

HOPS IN CALIFORNIA.

NINETTA EAMES.

The Pacific Coast States are rapidly increasing their acreage of hops, whereas New York and Wisconsin are yearly lessening their yield. It is estimated that California's increase in hops since 1880, is 5,103,261 pounds. Last year this State took the lead in producing the highest average crop per acre, which was 1,648 pounds. Washington came next, averaging 1,625 pounds, Oregon 1,166, New York 547 and Wisconsin 443 pounds per acre. Hops raised in California have, up to this time, been totally exempt from the hop louse, which so seriously damages the crop of hops in Eastern States, Washington and Oregon. The high winds, blight and mildew of other localities, are also difficulties not met with here; while the superior size and flavor of the strobiles recommend Western-grown hops to Eastern and foreign purchasers.

The largest hop plantations in the world are along the rich alluvial bottom lands of the Sacramento, Russian and Feather rivers. The last year has not been so encouraging to the growers as some previous seasons, though the yield has turned out better than was anticipated in the early summer. A ten days' stretch of hot weather caused considerable shrinkage of the crop in some localities, and, during the picking, light rains interfered with the progress of the work.

The size of a California hop farm ranges all the way from ten to 280 acres, the latter figure being the actual dimensions of the Lovdal plantation on the Sacramento River. When picking and drying, four hundred Indians, Chinese and Japanese are given employment here, besides fifteen or twenty white men to handle the hops in the kilns and packing-house.

A Pacific Coast hop farm resembles one in the East, where the "horizontal" method of training the vines is adopted. This system consists of making the hops run up poles eight or ten feet in height, and connected at the tops by strong hempen twine, thus forming an extended support for the luxuriant tendrils. The poles are left standing until after the picking, when they are pulled up and stacked for the winter. In the fertile valleys of Mendocino, where hops are the chief staple, Indians are hired in the spring to cultivate and sucker the vines and start them to climbing the poles. A couple of strong shoots are selected from each hill, and held to the stake by strips of cloth or soft string. They need careful manipulation, owing to their brittle texture, and are more safely handled when the sun is hot. The Piute and Digger Indians are adepts at hop culture,

Fig. 1. HOP YARDS IN THE RUSSIAN RIVER VALLEY.

from the planting of the roots to the picking of the clusters. It is only when it comes to the curing and baling, that more intelligent help is required, and experienced white men are employed in order to secure the best returns from the crop. Altogether the hop pickers of Mendocino numbered nearly three thousand the past autumn. In the last week of August, picking begins in Russian River valley, Mendocino county, and young and old, Indians and Chinese, the latter in the minority, flock to the various hop farms. A majority of these people bring their utensils for camping under the magnificent white oaks, which are a conspicuously beautiful feature of the landscape around Ukiah. For several ensuing weeks, a semi-barbarous life goes on, the days spent in picking hops, and the evenings gay with social gossip and singing. Not all these hop pickers work from necessity. Many join the army of field hands as much for health and recreation as for the wages earned. The aroma of the vines is a marvelous stimulant to the appetite, and Mendocino dyspeptics sensibly prefer this aeriform "Hop Bitters" to the patent article furnished by druggists.

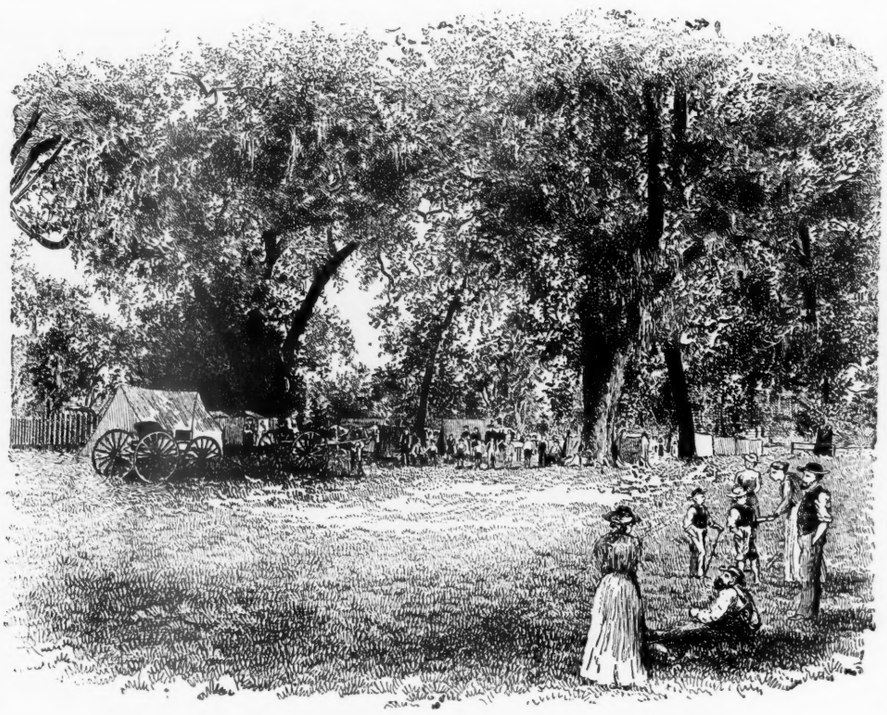


Fig. 2. A CALIFORNIA HOP-PICKERS' CAMP.

Women are said to be more conscientious pickers than men, and Indians are invariably preferred to other help, not excepting the Chinese. An Indian, to use a familiar country phrase, "is as straight as a string." He picks slowly but clean, and is absolutely trustworthy. No one hears of finding a stray match in his sack, either dropped there carelessly or intentionally. When the hops are spread to dry above the great iron furnace pipes, a match among them would ignite and set fire to the whole mass. Indeed, a fire at this period is the supreme dread of the owner. This misfortune frequently occurs. A hand who chooses to take offence at treatment received, is open to the suspicion of putting matches into the hops as an easy way of revenge. The picking of hops, though an eminently

picturesque occupation, is not without its serious discomforts. Hop vines with their harsh stems are severe on the hands, while the deep, pulverized soil between the rows, and a streaming sun overhead, make it hot and dusty work. The Indians and *mahales* (squaws) pick in separate groups from the whites. Their usual method is to dig a shallow hole in the ground, spread a piece of sacking over it, and then squat around in a circle while picking off the balls which they toss in the cloth. In this manner they "lump" their earnings, trusting to their "captain"—each *rancheria* has a head man, or captain, who is general manager—to see that individual rights are observed when it comes to a settlement. The *mahales* are always more industrious than the men. The whites customarily pick in large-hooped grain sacks, which they wear suspended by a strap to their shoulders or waists. When filled, they carry their sacks to the weighing yard where each individual has the number of pounds he has picked set down to his credit. An average hand gathers a hundred pounds in a day, but an old picker will sometimes treble this amount. They are paid by the pound, the price varying a trifle with different years. The last season, Chinese help received ninety cents per one hundred pounds, the Indians $1.00 and the whites $1.10. Ukiah valley alone pays in the neighborhood of $60,000, yearly, to gather and dry her hops.

A hop kiln in California is usually made of brick, and is a capacious structure with funnel-shaped roof terminating in a large, square chimney and a raised platform, with an outside stairs leading to it. Sometimes there are four furnaces, over each of which is a kiln measuring 30x30 feet. After weighing the hops they are hoisted to the platform, and thence emptied on the drying floor to the depth of two and a half or three feet. After the furnace is lighted, the hops are stirred about with a wooden rake or fork in the hands of an overseer who changes off with another workman every twelve hours, thus keeping the process going both day and night. When they are sufficiently dried, the inner side of the kiln is raised by means of hinges, and the hops are shoved through to the cooling floor which is several feet below. After being kept here some hours, the now thoroughly desiccated mass is transferred to the warehouse which has a capacity of 1,200 bales, each weighing from 200 to 250 pounds. The shifting of the hops to the warehouse is more easily accomplished than might be at first supposed. A large cloth is spread on the floor of the cooling room, into which the hops are forked to the amount of four or five hundred pounds. The corners are then secured together, and the bundle is run by a pulley along a wire cable to the warehouse. The hops are then baled in a machine much like that used for baling hay. When ready for market, these bales are compactly sewed into firm burlap.

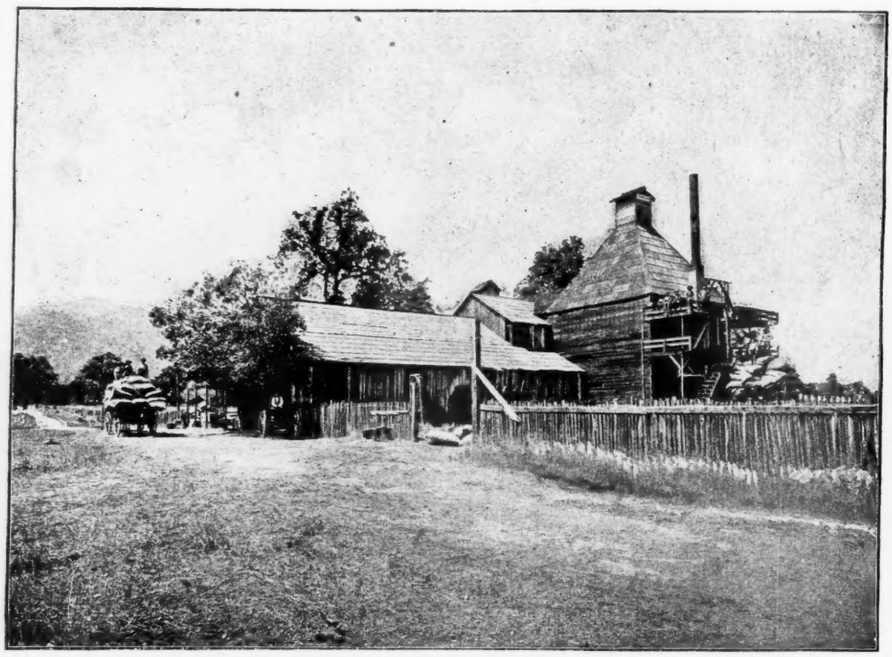


Fig. 3. HOP KILN NEAR UKIAH, CALIFORNIA.

An ingenious innovation in a hop kiln is seen in the suburbs of Ukiah. It is a second drying floor directly above the first, on which the hops dry equally well, thus doubling the capacity of the kiln with no extra outlay of time and fuel. Another improvement in this same kiln is the substitution of coarse net for the burlap carpet covering the wire drying floor. This net is similar to the nets used by fishermen, and is not so liable to take fire as burlap. Not a few California kilns are absolutely fireproof, while the floors are movable cars. When the hops are dried, great iron doors are dropped, and the floor is moved over to the cooling room. These car floors are unloaded by a large shove, operated by horse-power. The length of time hops are subjected to the heat of the furnace varies according to the judgment of the owner. One of the most successful growers in Ukiah allows his hops twenty-two hours on the drying floor, believing that a too high temperature causes a rapid evaporation of the peculiar essences so highly valued by hop experts. The cost of putting California hops upon the market, is commonly estimated to be six cents, though excellent authorities give ten cents as coming more nearly to the right amount. Those hop raisers who do not wait for exorbitant profit, but sell their crop at a fair price in the beginning of the season, have steadily gained ground, and are enthusiasts on the subject of California hop culture. The overplus of hops in this State is shipped to Eastern cities and England. [Fig. 1, shows a hop yard in the Russian River valley, and pickers at work; in Fig. 2 is seen a hop-pickers' camp under white-oak trees; and Fig. 3 represents the new hop kiln near Ukiah.]

HOW A DRIVE-WELL IS MADE.

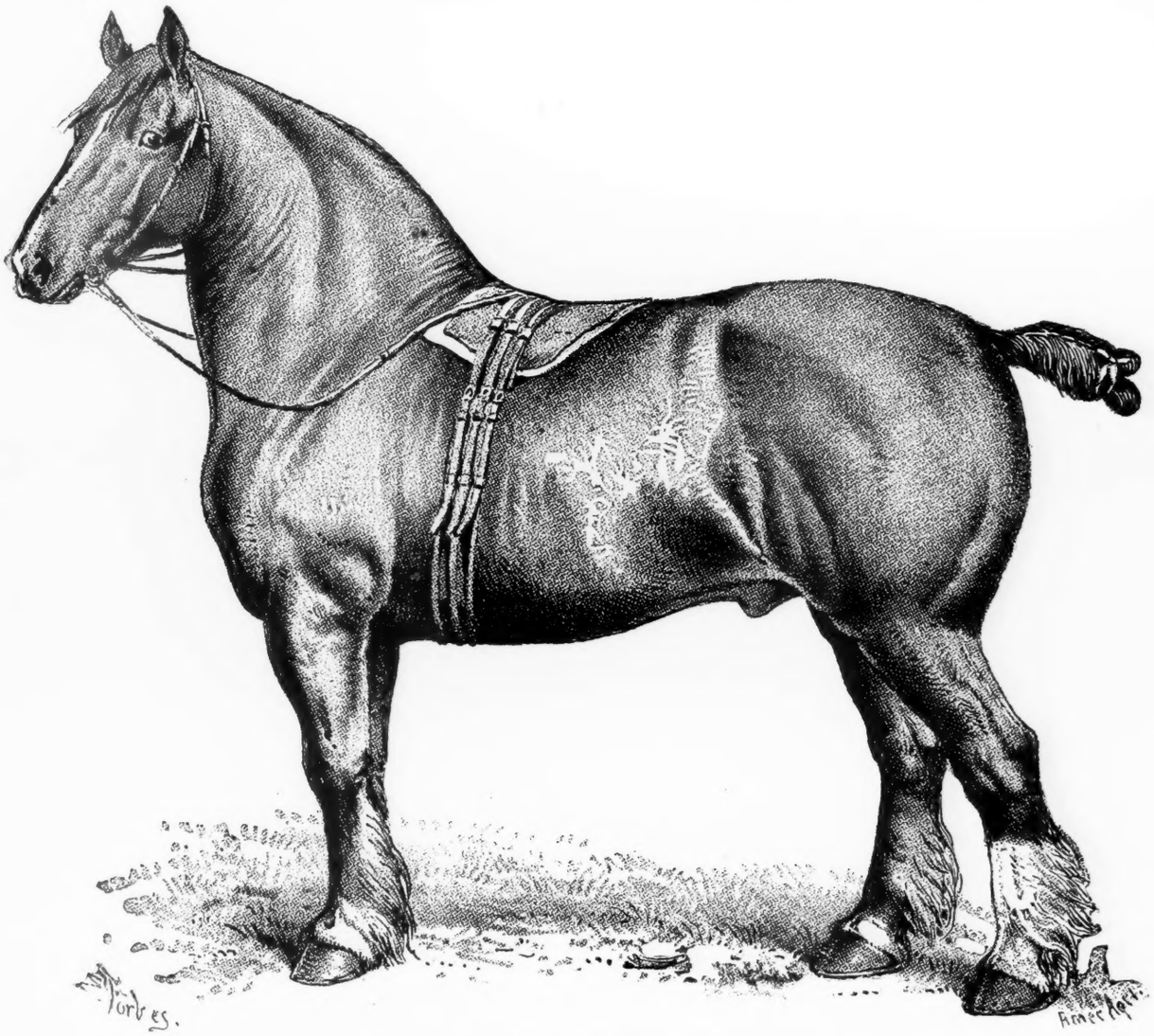
E. R. WOOD, MICHIGAN.

Our cows were formerly supplied with water from a spring in the barnyard, and, as it was constantly flowing, it seldom froze over. Last winter, however, the flow of water was less than usual, and the water in the trough frequently froze, and had to be chopped out in the morning before the cows could drink. This was not in accordance with profitable dairying, as the water was much too cold to be taken into a cow's stomach; accordingly it was decided to put down a drive-well in the cow barn where the water could be pumped into a trough directly in front of the cows. A man, with the necessary tools, was hired to do the work. The spot selected was in the alley between the two rows of cows at the end where the cut feed is mixed with grain. It required about two hours to reach a depth of fourteen feet where a good vein of water was found. Of course, the depth necessary to reach water varies with conditions and soils. The tools consist of a two-inch auger, welded to a section of gas pipe which is driven down like any auger, using a gas pipe wrench to turn it. The auger brings up the dirt as it goes down. If more than one section of pipe is necessary to reach water, another section is screwed on, and the boring proceeds as before. When water is reached, the sand that comes up will be wet. To ascertain if of sufficient quantity, pull up the auger and drive in a corresponding length of ordinary gas pipe. Drop a lead, fastened to a cord, inside the pipe which will tell the depth of water. There should be at least two feet of water and, of course, the more the better. If the lead shows an insufficient depth of water, the pipe must be pulled out and the auger replaced, boring until a sufficient amount of water is obtained. When the auger is pulled up for the last time, a "point," made of brass, perforated to let the water through, is screwed to the lower end of the pipe that is to remain in the ground, at the top end is placed a common pitcher pump, and the well is complete. The whole cost, including pump and labor, was five dollars and a half. It furnishes an abundance of good water of a temperature warm enough for any stock to drink. Now, there is no shrinkage in the milk on cold days, as we often noticed before, and, although we advocate letting the cows out on pleasant days for exercise, we are much pleased with a plan, so cheap and effective which does not necessitate their enforced exercise in the direction of the spring in the midst of a snow storm or a cutting wind—a measure of economy all can practice.

AMERICAN-BRED SHIRE HORSES.

It is a quite prevalent belief among English breeders, and some Americans with Anglo-maniac tendencies, that British breeds of heavy draft horses deteriorate in the United States. As a proof, they point to the fact that a large majority of the prize-winners in the American show rings are imported animals. At the first glance this would seem to furnish some foundation for the charge, but in fact the idea is wholly fallacious. The fact that few American-bred Clydesdale and Shire horses are seen in American exhibitions is no proof that as good horses cannot be bred and reared here as in Great Britain. But most of the importations of British draft horses are stallions, and their progeny foaled in this country are largely grades. The same talk about the deterioration of American horses was once applied to thoroughbreds But when racers like Ten Broek and Iroquois were taken to England and there snatched victory from British horses on their own turf, that sort of talk ended. So it will be with regard to heavy draft horses. When Clydesdales and Shires shall have become permanently established here, and the eager demand for grades out of native mares is, to some extent, filled, there is no doubt that the principal part of the breeding stock will be of American birth. The illustration herewith is the portrait of the American-bred Shire stallion, Major's Sort 2857, which took the first premium at the Chicago horse show last November, in the class for stallions two years old. He was sired by the famous prize-winner, Holland Major, and was bred by George E. Brown, of Aurora, Ill. The young stallion is truly a "worthy son of an illustrious sire." It is quite reasonable to expect not only that heavy draft horses of American birth and breeding will compete successfully in our show rings with imported stock, but also that the tide will turn eastward, and British horse marts will be supplied with American draft horses. With our cheap lands and cheap feed materials, a horse can be reared to the age of three years, and carried to Great Britain at less cost than it can be raised there. At present the American demand for well-bred heavy horses is so active that there is no considerable surplus to export.

The outlook for heavy draft-horse breeding was never better than it is now. The census reports show that the tendency of population is toward the cities. While they are growing with unexampled strides, the rural population has actually fallen off in some of the older States. It is well known that the great bulk of city traffic calls for heavy horses, more especially since electricity and cable traction have largely superseded the use of horses for street railroads. On the other hand, in the more recently settled regions, where the farming population is increasing, the farms are generally well adapted to the use of improved agricultural implements and machinery, of a character to require heavy horses to operate them. The sulky plow, with two or more mold boards, the broad press-drill, the self-binder, the cutaway plow and harrow, and similar implements, require heavy teams to operate them. By their aid one man can farm a much larger area, and do it better than the most skillful and muscular farmer could with old-fashioned tools and a light team. This kind of farming creates a constant and increasing demand for heavy horses, besides the growing requirements of city traffic. The market is now overstocked with light horses too small for roadsters, too weak for draft horses. These are the product of would-be-trotters and of pony mares. Large horses cost no more for raising, and a salable product is certain. One draft horse will do the work of two small horses, and require less attention. Heavy horses are as good as cash in any market.



SHIRE STALLION, MAJOR'S SORT 2857.

ARRANGEMENT OF A COMPLETE POULTRY HOUSE.

ELMER E. SUMMEY, NEW YORK.

A neighbor of mine has a poultry house which seems particularly well adapted to the comfort of the fowls. The building is eighteen feet long and twelve feet wide, with a single span roof. The front is seven feet, and the rear four and one-half feet high in the clear. The cracks on the sides are covered with battens two and one-half inches wide, and the work has been done so carefully, that it is almost perfectly wind-proof. Although we have had a temperature as low as 11° above zero, yet there was no sign of frost during the day, and at night, when the chickens were in another room at roost, water had only a thin crust of ice on the surface. The front, which faces the south, is formed entirely of three hotbed sashes set up on end, with about eight inches between them, and reaching nearly to the roof. A similar sash is also fitted in at each angle so that the sunshine is admitted from sunrise to sunset. It is so arranged that, without any trouble, as the weather gets colder, another sash can be set back of the first one, thus making the glass double, with an air-space between.

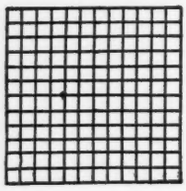


FIG. 1. COVER FOR WATER DISH.

The ground floor is raised about six inches above the surrounding level. The dusting place in the front is raised several inches, and the space between the ground floor and the dusting floor is filled with straw in order to keep the dusting material drier. The floor is made tight by putting lath over the cracks, and strips three inches wide are nailed around the four edges, to hold the dust. Dry dirt is very good for dusting.

Coal ashes make the best material for a dust box when run through an ordinary ash sieve, removing the larger clinkers, but leaving many small bits which the hens like as well as gravel. The ashes are taken from the stove as warm as possible, and, after spreading on the dusting floor, a small quantity of pyrethrum (insect powder) is sprinkled over them. Sand, which has been wet with a rather weak solution of carbolic acid is also supplied occasionally. The dust raised by the chickens, especially on a rainy day, gives evidence of their enjoyment, and that it is in the right place. Fresh ashes are placed on the floor every few days, if they can be spared from the roosting house, and once a month the box is partly emptied, clean material being thus constantly supplied to the hens.

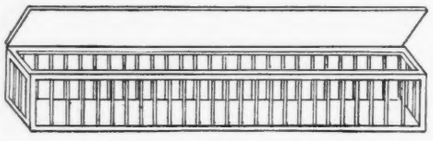


FIG. 2. FEEDING BOX.

In the center of the house is a post which aids in supporting

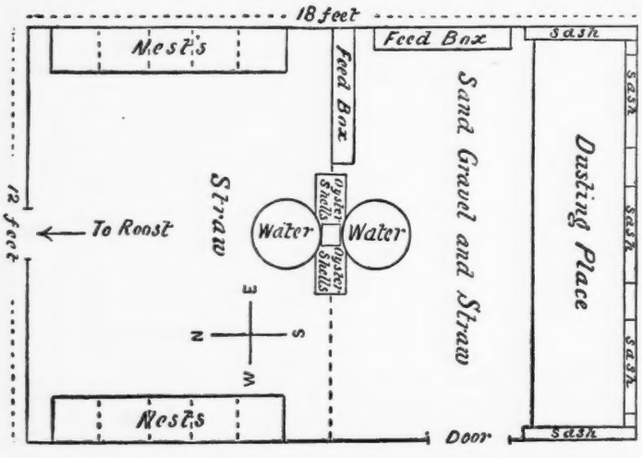


FIG. 3. GROUND PLAN OF POULTRY HOUSE.

the roof, and to this are fastened the watering dishes and the boxes containing shells and similar material. The watering dishes are simply tin pans sunk into the ground so that the top is even with the surface and then covered, as shown at Fig 1. This is made by nailing thin slats, half an inch wide, crosswise, so that interstices an inch and a half square, or so, are formed. This is fastened to the post with a leather hinge, and dropped down over the pan of water. Thus, the fowls cannot get into it with their feet, while it allows free access to their heads, and the water is kept pure.

The position of the feed boxes, of course, is not essential, but they should be placed in the most convenient spots. They are formed, as shown at Fig. 2, by taking a board twelve inches wide and six feet long and nailing eight-inch lengths of lath around the edges about two inches apart. The upper ends of the lath are nailed to strips an inch and a half square, of such lengths as to make the top the same size as the bottom. To one side a light half-inch board is hinged so that it can be raised to place the soft food inside, then closed to prevent the fowls from trampling on the

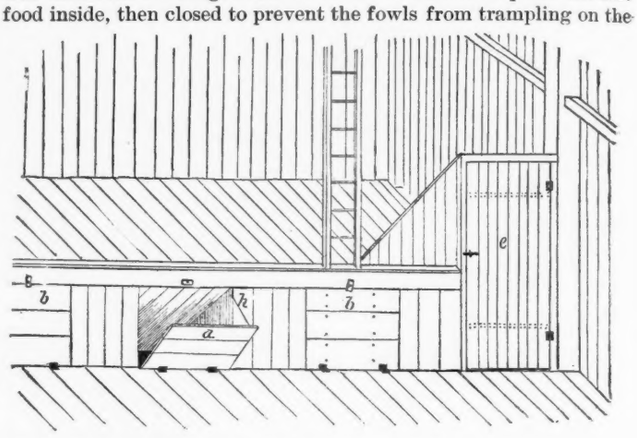


FIG. 1. PERSPECTIVE VIEW OF SECTION OF BARN INTERIOR.

food; when needful, this box may be readily washed off by means of a broom and water. It should be scalded occasionally.

On the rear part of the floor about an inch of cut straw is placed, in order to keep the feet of the birds from the damp ground, and also for scratching purposes, a few oats or other grain being thrown among it each day. In another portion sand, gravel and straw, mixed together, is placed, on which the grain feeds are thrown, and this supplies pebbles as well as scratching facilities, the straw preventing the sand and gravel from becoming packed too solidly. The ground plan of the house is shown in Fig. 3.

HAY, STRAW, AND GRAIN CHUTES.

The pioneer plan of throwing the hay and straw out of the shed window or barn door, and then scattering it about for the stock, is quite done away with in modern farming. In Fig. 1 above is shown a portion of a barn interior, beneath which is a basement for the horses, cattle, and sheep. They are reached through the door *e*, which opens on a stairway, and the hay is thrown down through the chutes, directly to the mangers, or in a large rack, as desired. At *a* one of the chutes is shown open. The door is hinged at the bottom, and, when open, the top is retained at a certain angle by the strap *h*. Wooden buttons hold the doors closed, and thus prevent a continuous draft from below.

In Fig. 2 several other plans are shown, that at *n* being simply a hole in the floor, with a hinged door to fit it; that at *m* is a hole

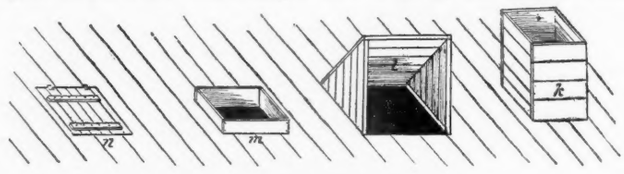


FIG. 2. VARIOUS FORMS OF CHUTES.

with a curbing. It may be provided with a hinged cover. The plan at *l* may also be provided with a door. At *k* is a box or bin holding several bushels. It has a chute leading down into the basement, from which grain or chopped feed, placed in the box above, may be taken as needed through an arrangement similar to that used in all flouring mills, a hopper bottom with slide door.

To Prevent Fire-Fanging Manure.—Stable manure from New York city is used largely on the north shore of Long Island, coming in schooners carrying thirty to fifty tons each. The manure is unloaded in a heated condition, but the loaded wagons, being driven over the low, flat heap, pack it so thoroughly that there is rarely any burning except a little on the sides. And to prevent this it is

only necessary to cut off the outside layers and throw the manure to the middle of the heap. It is usually procured in summer for using on wheat in the fall keeping during warm weather.

FOLDING TRELLIS FOR CLIMBERS.

At the North it is necessary to lay down, for winter, tender climbers like the clematis, ivy, etc., and it is desirable to do this without detaching them from the trellis which supports them. In our illustration, Fig. 1, is shown the lower portion of a folding trellis, and in Fig. 2 the same is shown folded down for winter, in which position the vine is readily covered with straw or evergreen branches, as desired. The stakes that are driven in the ground should be of durable wood, and thoroughly soaked in oil, to prevent decay. They should project above ground at least one foot. The lower hinges may be bolts, while the upper pin or stay should extend across the trellis, as seen in Fig. 1. It may thus be used for, and will act as, a support to the vines, and when removed will allow them to be bent over without pressing, at right angles.

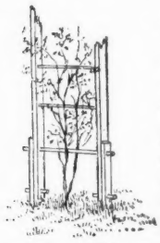


FIG. 1. FOLDING TRELLIS.

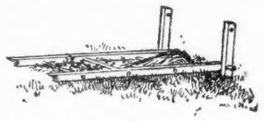


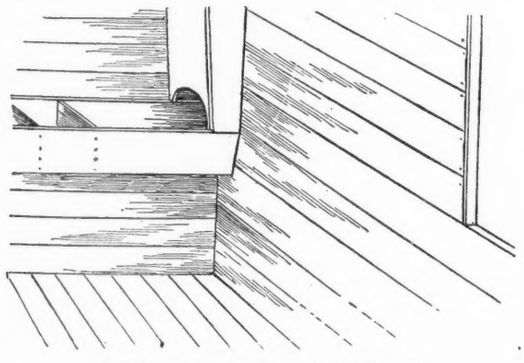
FIG. 2. FOLDING TRELLIS LAID DOWN FOR WINTER.

DESIRABILITY OF EARLY FOALING.

Whether to breed for fall or for spring colts is a question to be decided by circumstances and conditions. If there is very heavy summer work for horses, the mare can better support a colt by her side than carry a foal to drop in the fall. But she must have an abundance of nitrogenous, milk-producing food, and much more of it than the geldings, that are merely taking care of themselves. The aim should be to have spring colts dropped early—in March, April, or May. The great advantage of early foaling is that the colt is vigorous and strong by fly time, and will not become so thin under the annoyance of the flies. If the colt is a month or more old, when the grass is fresh and tender in May and June, he will obtain a good deal of nourishment from it, which he would not get later in the season, when the grass is less succulent. The mare having her colt early is in good condition for the harder work of midsummer, if she has had plenty of good feed. A disadvantage of early foaling is that the foal may get chilled. Besides, it cannot run out in the open air and exercise. A warm, large, well-ventilated, loose box, greatly lessens the objection to early foaling. Early foals can have two or three months on pasture after weaning, which is much better than putting them from the dam's milk to dry hay and grain. Something is also gained in age, which is important with trotters where they are entered in races, for the age of a horse is reckoned from the beginning of the year in which it was foaled.

HAYRACK AND MANGER.

The hayrack and manger shown in the accompanying illustration is very cheap and simple, and will be found equally as serviceable and far more healthful than those costing three times the amount. It is intended for those who feed their horses hay from above. The front of the rack, or chute, is twelve inches wide at the bottom and twenty inches at the top. The side is from twenty to twenty-eight inches wide, the lower end being cut away as shown in the engraving, the distance from the bottom of the manger to the top of the arch being sixteen inches. The hay, when placed in the top of the rack, will fall or settle to the bottom, and the horse in eating the hay pulls out a mouthful at a time, all the leaves, seeds, etc., remaining in the manger. The horse does not get his eyes or mane full of dirt, hayseed and foul dust. With many styles of feed racks, the health and eyesight of the horse is much endangered by the floating dust in the still air.

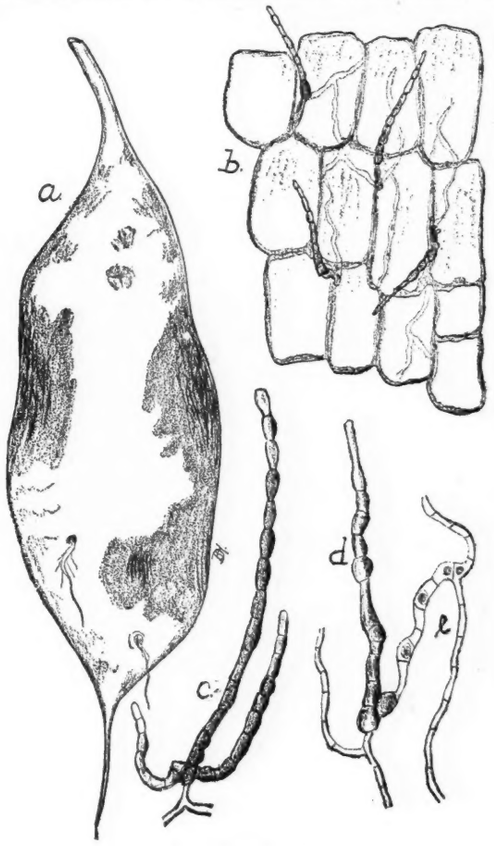


SERVICEABLE HAYRACK AND MANGER.

THE SCURF OF SWEET POTATOES.

DR. BYRON D. HALSTED.

Last month, in talking with a sweet-potato grower of long standing, the information was offered that, while the "rusty coat" or scurf of the sweet potato has been known for a long time, it is not until recently that any one thought much about it. Now, and particularly within the past two years, the buyers are looking closely to this matter, and are willing to pay half a dollar or more per barrel for the bright roots over those that are rusty. Within the past year the difference has been greater than this, and in many instances there was no market for those attacked by the scurf, while fair-skinned roots sold at a good, but not a high, price. Growers are beginning to ask of the experiment stations what can be done to prevent this trouble, and rusty specimens are sent in with the question: If these are used in the hotbed for sprouts will they communicate the scurf to the next crop?



SWEET-POTATO SCURF.

This scurf, or russetted skin, is caused by a vegetable growth, and it is well to know this before considering any methods of attempting to prevent its appearance. The dark mold is a low form of fungus similar to the various kinds that grow upon all sorts of organic substances. It consists of microscopic threads, that penetrate the sweet potato for a short distance, and then send branches to the surface. The skin of the potato at the place infested takes on a brown coloration, due partly to the dark color of the fungus threads, but more particularly because the superficial layers of cells of the potato have been killed, and thereby turned brown. The engraving will enable the reader to get a clearer idea of the scurf fungus. At *a* is represented a potato partly coated over with the scurf, and at those places where the mold is worst the root has taken on a wrinkled appearance, due to the drying out of some of the juice in the cells near the surface, or its absorption by the

filaments of the fungus that has been feeding upon them. This tendency to shrink of the affected potatoes, together with the less attractive color are the two chief direct disadvantages of the scurf. It is, however, true, that a scurfy potato, having, as it has, the skin more or less roughened and disorganized, is more subject to the attack of other forms of mold, some of which are very rapid in their work of destruction. Thus the soft rot fungus may get a foothold in the skin of a scurfy potato, while a smooth, healthy-skinned one might go free. At *b* is shown a highly-magnified view of the surface of a scurfy potato, and several projecting filaments of the mold are represented. The branching, finer threads of the fungus beneath the skin are seen as indistinct and irregular lines. One of the free, upright, dark chains of cells is shown highly magnified at *c*, with two younger filaments arising from the same base. At *d* is another chain, with less regular cells than at *c*, and a larger portion of the branched threads, from below the surface, shown at *e*. This scurf is upon the roots above the potatoes, extending sometimes to the surface of the ground.

From the fungus nature of the scurf it is natural to suppose that the trouble may spread from the affected root to the sprouts, should a scurfy potato be used in the hotbed. It would be a wise precaution to exclude all but roots that are free from the mold. As seems to be true with the scab of Irish potatoes, so here the chief inducing condition is the presence in the soil of large quantities of rotting manure. Sweet potatoes, as has been abundantly demonstrated, can be grown profitably without so much manure, and, in fact, without any. Commercial fertilizers may be used much more extensively than generally supposed, to the special advantage of reducing the amount of the various forms of rot, decay, and blights of various sorts. In time it is hoped that some method of treating the hotbed, or the sprouts as they are set, or possibly the field plants, may be found that will materially diminish the scurf, the soil rot, and the black rot, while at the same time augmenting the profits from the crop. Fungus troubles that are located below ground are among the most difficult to reach with a positive remedy, and precautionary measures are, thus far, most to be depended upon.

COL. MARK COCKRILL'S HISTORIC MERINOS.

R. M. BELL, ILLINOIS.

It is due to some of the pioneer sheep breeders and their flocks to perpetuate the memories of their enterprise and achievements. In the early years of this century there were no such incentives to start the business of breeding sheep as now. It was a public-spirited, patriotic pride, in leading his countrymen to an independence and higher development of civilization, that led Col. Cockrill, without experience, without co-workers, without standards of excellence, alone and in Tennessee, to turn his attention from cotton and public opinion to embark in fine sheep husbandry. The pride he felt in his success in securing the world's honors at the World's Fair and every other exposition in his day, is to-day shared by every American fine-wool flock master. The record he left and the little that he wrote of his experience are encouragements to others to do in wool growing what he did. In the Museum of the Agricultural Department at Nashville, Tenn., in a glass case is preserved carefully, not only the fleece that made Col. Cockrill illustrious, and the first to give credit to American wool growing, but many subsequent years' fleeces, showing that what he had done could be repeated. It is sad to know that nothing remains of all that the energy, and skill, and enterprise of so distinguished a pioneer sheep breeder accomplished. The flock is not maintained.

Col. Cockrill was a breeder of Merino sheep for fifty-seven years. In 1812 he rode on horseback from his home near Nashville, Tenn., to Washington, D. C., and drove twelve sheep—all he could pay for—back to his farm. These were Spanish Merinos of the Jarvis and Humphrey importations. He was also among the first to become interested in the Saxony Merino sheep. He claimed that the Pennsylvania Saxony breeders of that period came to him for rams to improve their flocks. From 1835 to 1840 Col. Cockrill held large flocks of Merinos in Madison county, Mississippi, but was so severely encroached upon by settlers that he finally moved all his sheep to his estates near Nashville. The fleece of Saxony wool that took the premium at the London World's Fair, in 1851, was grown in Tennessee. This was a high prized honor for Col. Cockrill's flock, since it was won in competition with the Saxony flocks of all Europe. The flock numbered at that time seven thousand head. Three thousand of his sheep were killed by the United States troops during the late war. All would have been destroyed if he had not taken five hundred of them back into the hills out of the way. Gen. Rosecrans many years after the war, said, "Do you know that man, Cockrill, of Nashville? That man came into my office in Nashville and 'cussed' me as no man ever did before or since."

As a shepherd, Col. Cockrill has not been excelled by anybody in this country. He has been known to pick up a new-born abandoned lamb in the pasture and readily identify its mother by the family resemblance. He was an expert in wools, also. He gave a test before a party of gentlemen, blindfolded, and with one hundred samples of wool on a table, selected his own wool by touch, without picking up one of them from the table. His wool cabinet had samples from every noted flock in the United States and from every part of the world. He paid experts to gather samples for him. He was a close student of wools, soils and climates; and insisted that no country on the globe grew finer or better wool than his farm near Nashville, Tenn. He took the premium at the World's Fair in London, in 1851 and at Hamburg in 1863, as well as at every other exposition, proving the claims he made for his wools—that the climate and soil that could grow the finest cotton in the world was equally fitted to growing the finest wool. His skill overcame the climate.

At the death of Col. Mark Cockrill, his sons Cols. Mark S. Cockrill and B. F. Cockrill succeeded their illustrious father. Col. B. F. Cockrill gave his time and talents for a time to the flock so long historic in this country. After several years he became discouraged in the unequal contest with the dogs from the city of Nashville, and the efforts to secure a dog law in Tennessee. He sent his sheep to Texas, where, without proper care, they became a source of expense to him and were sold. Since then, the breeding of thoroughbred horses has given him great pleasure and profit. It cannot be that a man born and bred, as he, to love sheep, should not still have a most kindly feeling for them. In his elegant home in Nashville, he said to me one evening, "Sheep will pay a better profit on the same investment, with proper care, than any other stock in Tennessee." I asked him: "You doubtless gave the dogs a hard row before you gave it up and abandoned the sheep business?" "Yes," he replied, lighting a new cigar, "I killed a dog for every square yard of land on my farm. Not a dog was killed within ten miles that I did not get credit for." "Did you get into any trouble on this line?" "No, I never had any trouble, but was threatened with the law and the shotgun time and again."

Such are some of the enterprises, successes, experiences and changes that have come to the sheep industry of this country during the century now closing. The failure came from lack of patriotic pride and public interest to secure legislative protection to the flock masters against dogs. Here is an illustrious instance of a more profitable industry than any other livestock business in the sunny South, given up, utterly abandoned, because of hordes of worthless dogs. The Cockrill flock is only one. Hundreds, thousands more might be named that have been profitable and famous but which have gone out of existence for the same reason.

PLOWHANDLE PLODDINGS.

JONATHAN HAYSEEDS.

The first thing raised in the world is the easiest to raise still—Cain.

Plow the fields instead of the roads, and stone the roads instead of the chickens.

The knees of a boy's trousers are a case where the (w)hole is larger than a part.

If self-conceit were taxable, there would not be standing room for all the humility.

If time is money, the grindstone is one of the best savings banks the workman can use.

The man who is built to see both sides of a question alike, is as big a curiosity as a square gimlet.

The little judgment with which some men apply their learning, makes one wonder they had sense enough to get any.

The most ultraradical is a model conservative when it comes to greasing his neighbor's wagon with his own axle grease.

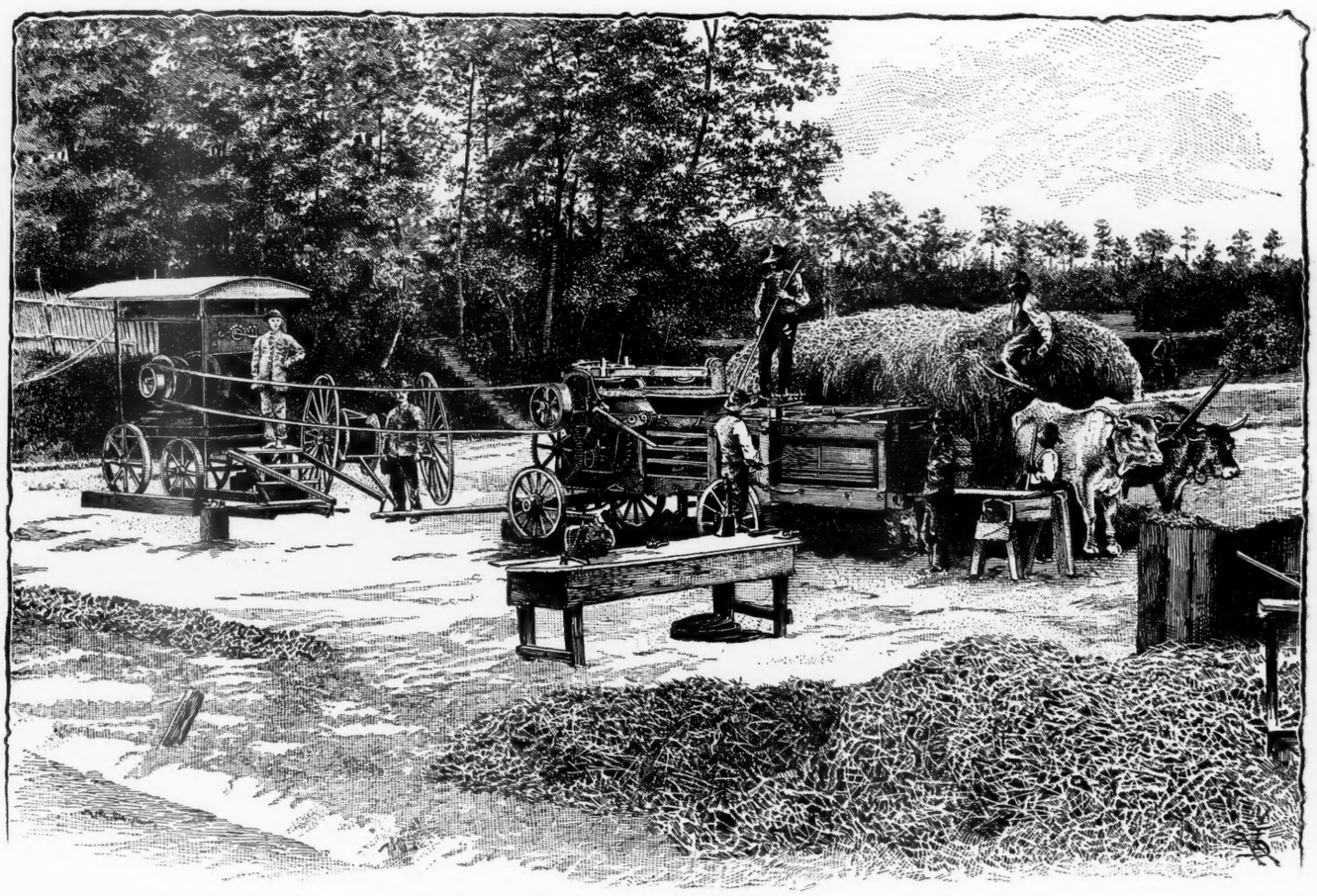
Don't carry a jack plane to smooth everyone by your chalk line. If there were no mountains and hollows in the moon, there would not be any moonlight.

Half a loaf is better than a whole loafer, so undertake only what you can do thoroughly, instead of getting your hands too full, becoming disgusted and neglecting everything.

ELECTRICAL POWERS IN FARMING.

The rapid advances in the application of electricity as a mechanical power is working almost a revolution. Throughout the civilized world electricity lights the streets, houses and factories, propels the street cars, drives all kinds of light machinery, welds and solders metals, and performs a thousand services, in a manner more satisfactory than that of any other mechanical force. A little motor, occupying no more room than a clock, is made to operate long rows of sewing machines, printing presses, or other machinery. On the street railroads the cars, under the propulsion of this invisible power, glide rapidly, with none of the tinkling bells, clattering hoofs, wear and tear of pavements, and inevitable filth which attend the use of horses for this purpose. Large projects are under discussion for extending electric railroads to greater distances than city and suburban streets, and the most serious obstacle to their speedy realization is the fact that the electric power decreases in proportion to the distance from its source. If economical means are found for transmitting the electric current long distances without serious loss, its use will enormously increase, and the water power of the Niagara, the Mississippi, the Missouri, the Spokane, and the Columbia, may yet be employed to send passengers and freight, at rapid speed, from New York to Nootka Sound.

The effect of all this upon agriculture has scarcely been felt, except incidentally. The substitution of electricity for horses as motive power on street railroads has thrown out of use large numbers of those animals, and closed up a profitable market for light horses. It is not unreasonable to suppose that light vehicles, propelled by storage batteries may, in the near future, be as common as bicycles are at present, displacing a still larger number of horses than electric cars have done. On the other hand, electricity will, without doubt, be largely employed to drive farm machinery. In Europe it is already used, to some extent, as a motive power for threshing machines, hay presses, etc., requiring considerable power. In this country its application to agricultural machinery is yet to come, but it will be in the near future. Already, a man in Minnesota has patented a plow to be operated by electricity, and this may well be regarded as the signal for general activity in this direction. So important is the subject that it has received the attention of Congress, and a bill has been introduced into the United States Senate to provide for experiments with electricity as a motive power for agricultural machinery. An electric plow has been operated in Western Kansas. The accompanying illustration, from a photograph furnished by Charles E. Whitman, St. Louis, Mo., represents an electro-motor threshing scene near Florence, Italy.



THRESHING BY ELECTRIC POWER.

THE RIPENING OF CHEESE.—ROQUEFORT.

HENRY STEWART.

We often hear of people who builded better than they knew. This applies exactly to the old cheese makers who have been so successful in making fine qualities of cheese of not only full milk, but also of the skimmed milk. The French people have excelled in this industry, making more than a hundred sorts of cheese, all differing in kind and flavor, and the differences all due to varying methods of curing. Why these differences should be made they could not tell, but, under our present light, we know they are caused by the action of special germs, now called bacteria, and varying in their action under different degrees of temperature, and of moisture. The action of these germs was delayed, or hastened, by the skillful management of currents of air, and the moisture regulated most carefully by means of ventilation by the use of shutters and windows. And yet they knew nothing of the particular agency to which the remarkable results were due. As compared with the skill of these cheese makers, we in America know absolutely nothing of the manufacture of cheese.

Take, for instance, the method of making the celebrated Roquefort cheese, which is a half-skim, and which under our system would be tabooed as unworthy of the attention of a dairyman, and yet it sells here for half a dollar a pound. The milk is first heated nearly to the boiling point, and then set for the cream to rise. Here is the first element, in the manufacture of which the action of the germs mentioned, is all through to be recognized, and this heating of course destroys all the undesirable kinds, and leaves the way clear for the undisturbed agency of those which are desirable in the after manipulation. When the cream has risen, a part of it

is removed for making a butter of delicious quality, and this, no doubt, because of the destruction of those germs that would otherwise have destroyed this exquisite flavor. This skimmed milk is added to the new milk of the next morning and both heated as before. Then comes the addition of the rennet. And here is another fine piece of work, based as we now know on this same germ action. The quantity of the rennet is quite small, only one tablespoonful to one hundred and twenty pounds of milk, but the temperature of the milk makes up for the small amount of rennet. The whey is not all drawn, but some of it is left to drain from the molds. And now comes a most important part of the business. The cheese is sown with the needed germs by which the curd is so acted upon as to change it into fatty substance during the curing. A sort of cake is made of barley meal, and this is kept in a damp place until a blue mold which is sown in it appears on it, and penetrates through it. This mold is not a real casein germ, and thus the cheese is sown with a foreign germ, that has quite a different action on the casein from that which would result from one native to the casein. The curd is thus inoculated with this molded bread, and the crumbs are distributed through the mass, as the curd is put in the molds. The cheese is then turned in the molds twice a day, so that the whey is retained until it becomes absorbed by the cheese. The whey, of course, retains some of the rennet in solution, and this has its particular action on the curd, which is closely related to the act of digestion in the stomach. This digestion is a special part of the curing of all the fine French cheeses. The young cheese remains under this process during three days, protected from the air, and is frequently sprinkled with warm water. This of course, favors the rapid growth of the germs with which it has been sown, and thus effects the first part of the curing.

The cheese is then moved to a drying house, having a cool north exposure, and exposed to drafts of cool, dry air. Here the growth of the germs is checked, and the cheese prepared for the germination of another kind of organisms. The cheeses remain three days until they have lost much of their moisture; this effect is hastened by wrapping them in dry cloths. They are then removed to the celebrated caves which are an object of much curiosity to the traveler who visits the ancient town of Roquefort for the purpose of viewing this curious manufacture. The town is built over several caverns in the limestone rock, and as usual, in such caves, there are continual currents of cold air passing through them, while the low temperature is rarely affected by that outside, and light is wholly excluded except that of candles. Here, in this favorable situation, the cheese undergoes a long and slow process of curing by which its peculiar character is acquired. This is not inherent in the curd, but is wholly due to the action of these special germs upon it. Not only is the temperature steady, but the moisture of the air is, too, and thus the change in the cheese is simply a matter of time and exact manipulation.

The handling of the cheese in the caves is wholly a culture of certain fungous growths. At first the cheeses are gradually cooled to the temperature of the caves, which is from forty-five to fifty-five degrees, and thus favorable only to a very slow growth of the molds, and not favorable to any kind of actual decomposition. This is perceived to be a point of importance under a knowledge of the actual character of the curing process. It secures the slow growth of the favorable germs, and avoids that of injurious ones. The cheeses are here salted by sprinkling salt on the surface of each, and placing one upon another in piles of three. At intervals of twenty-four hours they are reversed and again salted, until three saltings have been given. They are then covered with a gelatinous matter which is scraped off with a thin slice of the cheese. This is sold for food. They are then placed on benches covered with dry straw, until various kinds of mold, first yellow, then red and finally blue, appear, and are scraped three times, or more, if thought necessary by the expert makers. When the curing process is completed the cheeses are wrapped in tin foil and thus preserved from contact with the air, and are dried and made ready for sale, some of them, however, which have developed unusual good quality, are kept for two or three years before they are sold or used.

All this intricate process, it is seen, is a simple culture of the special germs that produce a certain result on the casein, and in the end change it from a tasteless curd to a rich, fatty, creamy substance, having an exquisite aromatic flavor. The, at first, indigestible curd becomes a melting, easily digestible pulp, rich in fatty matters, and an agent for the digestion of other food. All this method has been learned slowly by experience, but in our present light, and knowing what we do of the nature of the ferments employed and cultivated, why may we not undertake the manufacture with a certainty of success? No doubt this will soon be done, and biology make easy what many years of slow practice only made possible. And why may not the curing of our common cheese be carried on now better than ever before? And, further, why may not the manufacture be so extended that cheese may become as popular an article of food as it deserves to be, considering its cheapness, its pleasing flavor and its high nutritiousness?

STARTING TO RAISE POULTRY.

J. W. CAUGHEY, PENNSYLVANIA.

People should be just as careful about going into the poultry business as they would be at engaging in any other industry. Do not think it is easy enough to raise chickens, and that anybody can do it. There are, perhaps, more failures among those trying to raise poultry on a large scale than in any other branch of farming. Before attempting it we would advise all to try and gain their first experience at the expense of somebody else. Take a position as laborer, or in any capacity, on a poultry farm, or if possible rent one before embarking all your own capital. Experiment for a season. You will never regret the experience. If successful, you will have learned much and be able to save money in arranging the place you buy. If unsuccessful, you want no more of it. Poultry papers usually publish the successes, but seldom the failures. In this they are misleading. Where most people do and can succeed, is in keeping a few hens about the farm, for the eggs alone. They are fed and cared for better, comparatively, than a large flock, and give better returns. I do not say that it is impossible to succeed on a large scale, but I do say that more fail than succeed. Therefore, I urge all to be careful when engaging in raising chickens on a large scale, and try to get experience before investing heavily.

To raise poultry needs considerable capital. You must not expect that the fowls are at once going to return money enough to keep themselves and you, too. If you rent a farm, you will always be spending your money in the improvement of the property of another, and will begrudge the erection of houses and yards that will be essential to your success. That will be an outlay for which you will get no direct return. Makeshifts in the poultry business are as bad as in any other business. If you buy your farm, pay for it outright, and then you will know exactly how you stand. Donot attempt to build your houses without having studied those of others, or the numerous plans that can be had from poultry books. Many of these plans are of little practical value, although they look pretty on paper. You want everything arranged for economy, both of time and labor, for the labor on a chicken farm never ceases from before daylight until after dark. Chickens need constant and zealous care, quite as much as the counting-house of a successful business man needs his ever-watchful and attentive eye, even in the most minute details. Go slowly and steadily, and always keep enough money on hand to pay every item of expenditure that you may incur for buildings, or your own living, for a year at least. Other things that you do not think of will absorb your first small receipts, and you may see some new breeds that you will want.

LATE TURKEYS.

JENNIE WATSON, ILLINOIS.

In the last fifteen years I have owned several turkey hens that have, while taking care of the first early brood, laid eggs, and then hatched a second brood toward the latter part of summer. I think vigorous hens will often do so if allowed to sit early. It makes the young turkeys rather late, but with good quarters and good care, they can be sold in February, as they will then be five or six months old, and, taking into account the higher prices to be obtained at that season, will generally bring more, than the early ones marketed before the Christmas holidays. If from lack of proper care they are not salable in February, they can be kept over, and make plump, heavy birds for the early winter market. Some of the heaviest and most salable turkeys that I have ever sent to market have been such very late broods, wintered over without extra care. Such hens will always be in demand by every buyer who wants a Thanksgiving or a Christmas roast, you may be sure; and the gobblers will not be overlooked.

A Neat Nest-box.—A cheese-box with a square entrance cut in the side makes a convenient nest-box for either a laying or sitting hen. Convenient, because it can be moved easily and hides the hen.

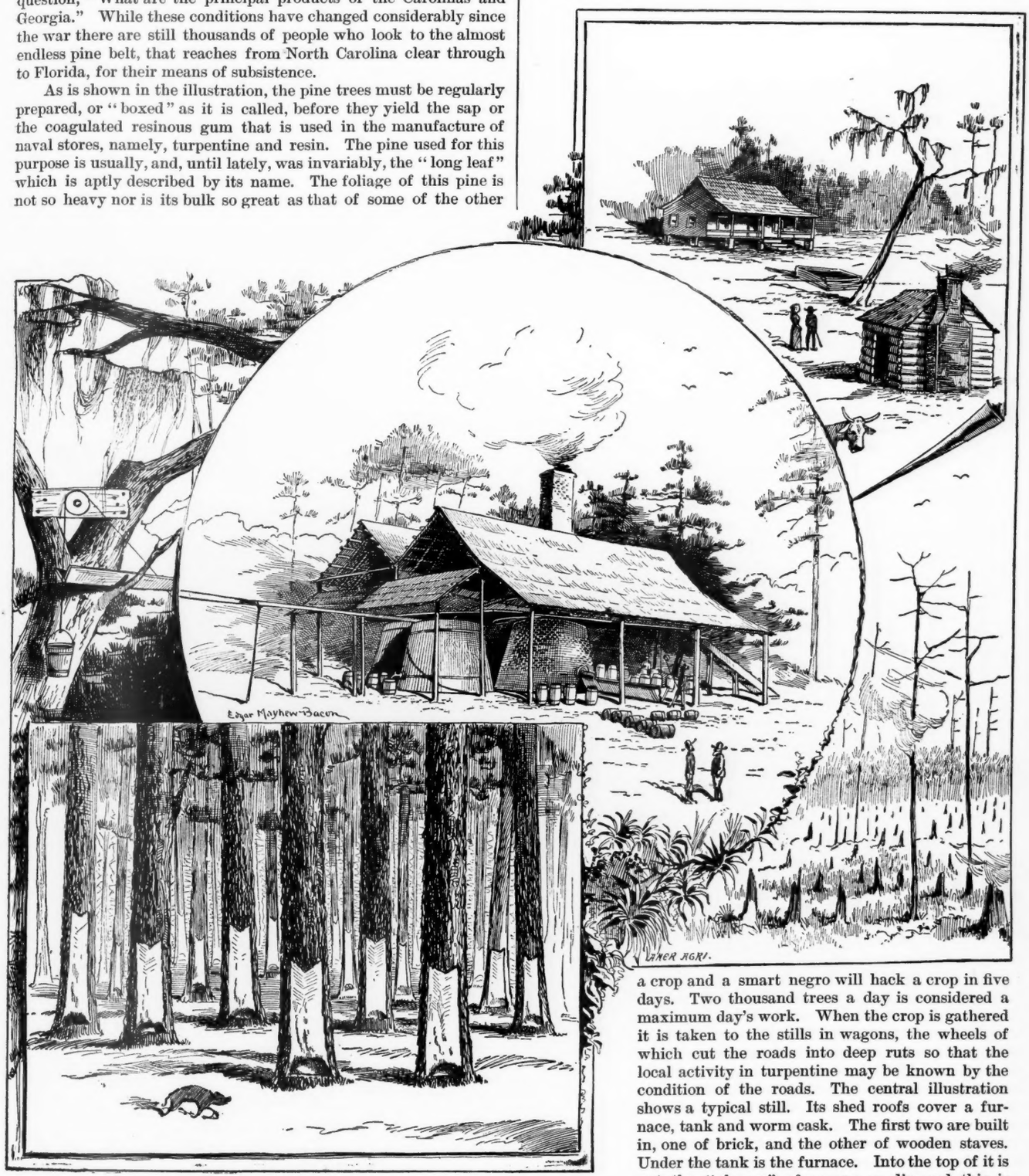
THE PRODUCTION OF NAVAL STORES.

EDGAR MAYHEW BACON.

"Pitch, tar and turpentine." That was the answer we used to give in school when we were asked the stereotyped geography question, "What are the principal products of the Carolinas and Georgia." While these conditions have changed considerably since the war there are still thousands of people who look to the almost endless pine belt, that reaches from North Carolina clear through to Florida, for their means of subsistence.

As is shown in the illustration, the pine trees must be regularly prepared, or "boxed" as it is called, before they yield the sap or the coagulated resinous gum that is used in the manufacture of naval stores, namely, turpentine and resin. The pine used for this purpose is usually, and, until lately, was invariably, the "long leaf" which is aptly described by its name. The foliage of this pine is not so heavy nor is its bulk so great as that of some of the other kinds but its yield is larger and its usefulness reaches over a greater period of years. It is only within the last three or four years that short-leaf kinds have been used as sap producers.

To box a tree is to cut into it on one side, near the base of the trunk, a cavity or well, into which the exuding gum may drip and collect. Above the box a clear space is made by cutting away the bark and scoring, or hacking, the trees with some sharp instrument to induce the flow of sap. In other words the tree is systematically wounded and bleeds. Much of the sap does not run freely into the hollow, but hardens in flakes upon the hacked surface above it, and this is taken off and is called "scrape"; the other is known as "dip." Ten thousand trees constitute what is known as a crop and a smart negro will hack a crop in five days. Two thousand trees a day is considered a maximum day's work. When the crop is gathered it is taken to the stills in wagons, the wheels of which cut the roads into deep ruts so that the local activity in turpentine may be known by the condition of the roads. The central illustration shows a typical still. Its shed roofs cover a furnace, tank and worm cask. The first two are built in, one of brick, and the other of wooden staves. Under the tank is the furnace. Into the top of it is put the "charge" of scrape or dip and this is melted and boiled till a steam arises from it. The hole at the top is covered, as soon as the charge is put in, by a great tube like a bent funnel, the small end of which descends at a slight angle to the worm vat. It is connected with the upper end of the worm, or copper coil, of pipe, down through which the condensed steam must pass till it finds a vent at the other end. The worm is surrounded by water kept cold in the vat, in order that the condensed vapor, or spirits of the turpentine, may be cooled in the passage.



THE TURPENTINE INDUSTRY OF THE SOUTHEAST.

While the turpentine spirits is thus being made by distillation after the same method that is used in the manufacture of other spirits, a vent at the lower end of the brick tank allows the residue or heavier portion of the resinous mass to escape into a broad trough, from which it is ladled into barrels, where it cools and hardens. This is resin. Usually the water which is used to cool the worm is carried from a neighboring stream, or well, in a rudely constructed trough. It is raised to the upper end of this channel by means of a bucket drawn up by a hand rope. In many respects the details of manufacture are crude and simple. If a still takes sixteen barrels of scrape to charge, which is a fair capacity, it will run out at a single charge one barrel of spirits and about seven of resin. If on the other hand the charge is dip instead of scrape the yield of spirits will be double, and that of resin half as much. In other words there is more of the resinous quality in the coagulated sap than in that which has remained fluid. Heat and cold have much to do with the character of the harvest. In winter the proportion of scrape is larger and therefore the proportionate production of resin is greater than in summer.

One can tell by looking at a crop how many years the trees have been boxed. Those in the illustration, for instance, have been boxed from two to three years. If they were hacked to about half the distance they are, they would be recognized by a naval-store expert as "yearlings." Long-leaf pine will last, with proper care, for a number of years. Often, through carelessness, fire gets into a turpentine farm before it is half exhausted, or even when the boxing is new, and the result is a total loss of the trees as well as of the initial labor. A forest fire among the pines often means great loss and damage, yet the utmost carelessness in regard to it prevails.

There is one recognized way of clearing a piece of land, that is, by burning. When nothing but a field of charred stumps is left, the proprietor puts up for himself a log house, perhaps, even, a clapboard shanty, innocent of paint, with a "po'ch" on the side and a mud chimney at the end. Then he plants among the blackened pine stumps his little "crap." A rail inclosure for pigs in front of the house, and a three-foot-deep surface-water well in front of the pig-pen is nothing unusual. But as one contemplates the thousands of barrels that are shipped at Wilmington and Savannah one cannot but think of the meager, barren and comfortless lives of the people by whose industry they are sent there.

HINTS FOR BUTTER MAKERS.

S. A. LITTLE, NEW YORK.

In Central and Southern New York there are very few farms where a small surplus of butter is not produced, and fewer where the dairy exceeds a dozen cows. In these small dairies it pays to raise the heifers which are to replenish the herd. Comparatively few of our old farmers care to incur the expense of buying a number of pedigreed cows, but the progeny of our best cows, if sired by a pure-bred bull from some good butter strain, are almost sure to be good milkers, and by careful selection a herd may soon be formed which will not only pay for its maintenance, but yield a handsome profit for the farm treasury.

Great care must be taken in training the young heifers. They should be petted and handled all their lives, so that they may learn that they will never be intentionally hurt. Secure in this belief, they soon learn to submit to being milked, and it is a rare thing to find one of them unmanageable. A little carelessness, however, on the part of the milker, will upset the best-laid plans—and the milk pail—the good lessons must be relearned and the bad one unlearned, which is by far the hardest part. Some writer has said: "Always speak to a cow as you would to a lady," and it would be well if all dairymen made a note of the motto.

Great care should be employed to keep the young heifers in milk as long as possible. It takes a large percentage from the profits, when cows are dry from three to four months in the year, or if their flow of milk decreases to any very marked degree during the last four or five months of the year.

Clean, warm stables, plenty of pure water, from which the chill has been taken, roots, or grain, or both, in addition to their dry feed, are conditions which secure success in winter dairying. Nor is winter the only time when the cows need supplementary food. As soon as the summer's drouth begins to shorten the pastures there should be plenty of corn, or sorghum, to supply the lacking feed. Sorghum is an especially satisfactory crop for this purpose, as the cattle will eat it up clean, and in favorable seasons the roots will sprout and produce a second crop of good fodder. Dairymen can hardly regard this plant too highly. If the leaves are left on the stalks when they are sent to the mill, the bagasse, or pressed cane, will be found better than cornstalks, and it may be fed fresh, or be dried for winter use. Cows eat it eagerly, with other food, and do well on it.

No matter how clean the stables are in which cows are quartered, there is sure to be a decided animal odor, so that it is advisable to remove the milk into pure air as soon as it is drawn from the cow. If it is strained at once, so much the better. In winter, the milk should be brought to a temperature of about 98° F. by the addition of from ten to twelve per cent. of warm water.

I am satisfied that from fifteen to twenty-two per cent. more butter can be made by the use of a good creamer than can be obtained from ordinary shallow setting in warm weather. It follows that a creamer will pay for itself in dollars and cents, as well as in the saving of labor. The butter made from a creamer is neither better nor worse than that made from pans, if the work is properly done, and the old cry that the butter made from a creamer will not keep, is simply ridiculous.

When the cream from two or more settings is to be churned together, it should be thoroughly mixed and kept cold until all is collected. It should then be warmed to 70° as quickly as possible, and a little sour cream or buttermilk added as a starter. As soon as enough acid is developed to be detected by the sense of smell, it is ready for churning. Cream should never be left until it becomes solid, but should have the peculiar satiny look which is so well known to the successful dairy maid. Frequent stirring retards the ripening somewhat, but it is an excellent practice. If the cream is set in pans, it is often sour when skimmed and needs no further ripening.

In small dairies it is quite possible to make excellent butter by churning on alternate days. Saturday morning's cream should be churned on Saturday afternoon, if possible, as it is likely to get too sour before Monday, and a little forethought will make it unnecessary to churn on Sunday.

One error in butter making, which it seems difficult for the inexperienced to avoid, is churning too long. The cream should be churned at from 62° to 64° F. in summer, and from 66° to 68° in winter, according to the temperature of the room in which the work is done. When the butter has "come," and is in grains about the size of wheat, the temperature should be reduced to 58°. Let the churn stand still for two or three minutes, then draw off the bulk of the buttermilk. Wash the butter with lightly salted cold water until the water drawn off is clear. Take up the butter and weigh it, then sift in from half an ounce to an ounce and a quarter of salt per pound, according to the taste of your customers. Opinions differ in regard to making butter, and many believe in giving it no working, except that which it gets from the motion of the churn while washing it in strong brine. I work my butter before packing.

There are so many dainty receptacles for small quantities of butter, that one cannot go amiss. There are round, wooden boxes, holding from one to twenty pounds; clear glass jars in half-pound and pound sizes, little tin tubs with wooden jackets in sizes to suit, and ice boxes in which these and other small packages may be sent in choice condition to distant markets. Butter is never better than when first packed, and I feel great respect for the customer who insists on having his weekly supply fresh from the churn on the day before delivery. Still, it is very possible to produce butter which will come from the jar in good condition after it has been packed months.

When packing butter in large jars or tubs, it is wise to lay a damp cloth over the top, and cover the butter at least two inches deep with salt. This may be removed any time when more butter is put in, by taking a firm hold of the cloth at all its corners and lifting the salt to a milk pan. It may be returned in similar fashion, and care must be taken to have the salt equally distributed over the surface. The jar should not be filled so full as to prevent a good layer of salt between the butter and the cover.

Boots for Young Horses.—Boots should be used in driving and breaking young horses, even though they are open-gaited and do not strike. Colts are looking everywhere but where they step, and sometimes get their feet mixed. In such a case they may hit a cord or tendon, which is apt to disable them for weeks or months, and sometimes for life. Charles Marvin, who formerly trained the Palo Alto colts, always booted the youngsters thoroughly when they took their work. Boots are not to keep a horse from interfering, but to protect him when he strikes himself.

THE ANONAS.

DR. LORENZO GORDON YATES, F. L. S., CALIFORNIA.

Among the many exotic fruit-bearing trees which might be cultivated with profit in the warmer portions of the United States, the different species of the genus *Anona* should not be neglected. Certain species have been grown, to some extent, in Florida, where, however, they are subject to injury by frost, by which that region is sometimes visited, although in favored locations they sprout up again from the roots. This will doubtless be the case in California which is occasionally visited by injurious frosts, and also in other localities where the orange and lemon thrive. But, to show that a tropical climate is not essentially necessary for the profitable cultivation of this fruit, I will instance a case in point. Some twenty years ago a tree of *Anona Cherimolia* was planted on the southerly side, and within a few feet of the residence of Mr. A. Packard, in Santa Barbara, Cal. The tree was raised from seed brought from Mexico, and carefully tended, well repaying its possessor by a thrifty growth and early fruiting. Little attention was paid to this experiment until some ten years afterward, when one of a committee in search of novelties to exhibit at one of the "Flower and Fruit Festivals," for which Santa Barbara became famous, secured one of the ripe fruits, which attracted a great deal of attention. After testing the fruit, the seeds were distributed, several trees being successfully raised from them, which have also come into bearing. Some of the fruit was exhibited at the great Citrus Fair of Southern California, forming one of the chief attractions. It was also exhibited at the "Great Orange Carnival" at Chicago in 1891, where it created a deep interest. The first year of fruiting, one or two fruits only were developed, and those dropped off before coming to maturity. The next year, a large number of fruits were developed, but showed a tendency to fall before they were ripe. Older trees retain their fruit until fully ripe. Those who live where the climate is not sufficiently warm to grow the Anonas out of doors, may, if they have a hothouse, derive pleasure from cultivating them under glass, and the further advantage of eating the delicious fruit when it is at its best. The Anonas are deciduous, of compact habit of growth, from ten to twenty-five feet high, and experience shows that the Cherimolia is the hardiest, as well as the finest flavored variety grown. It is a native of Peru, whence it has been introduced into Mexico and many other warm countries. The flavor of the Cherimolia has been compared to a blending of pineapple, banana, strawberries and cream, and various other "good things;" yet others are not so enthusiastic in its praise.

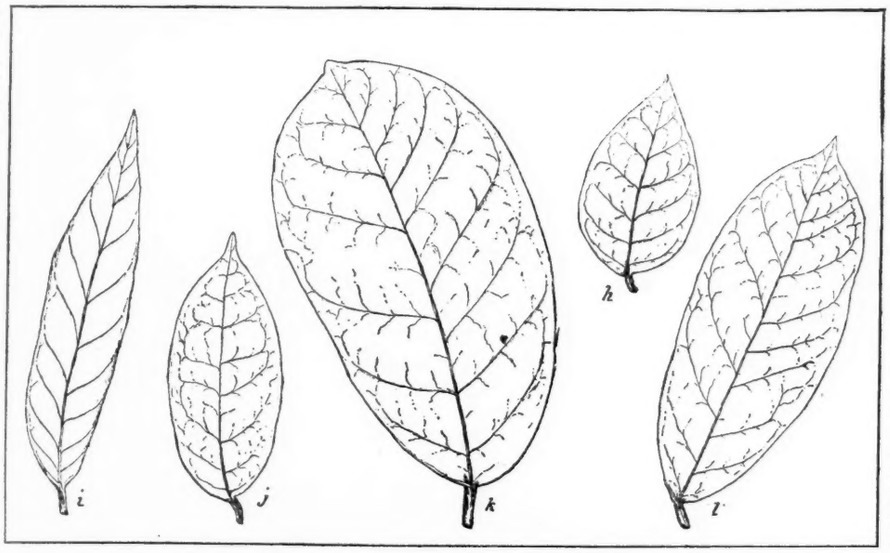


FIG. 1. OUTLINES OF ANONA LEAVES.

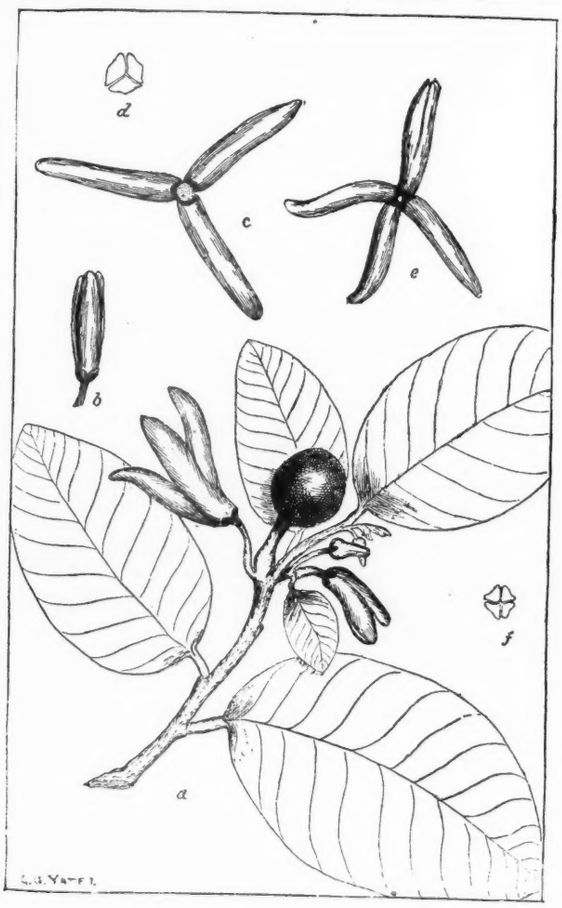


FIG. 2. FLOWERS AND FLOWERING BRANCH OF ANONA.

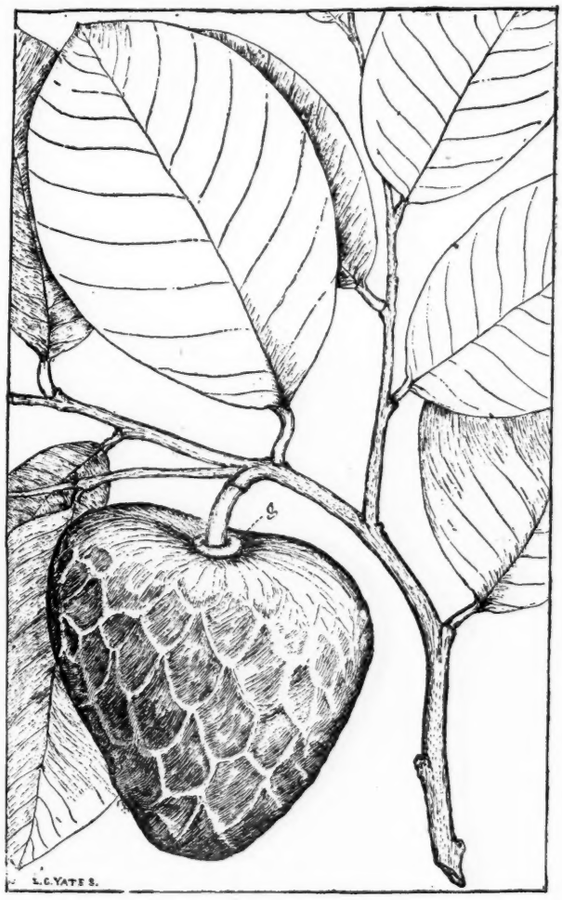


FIG. 3. RIPE ANONA FRUIT.

Another South American species, *Anona squamosa* (Sweet Sop, or Sugar Sop), has been successfully fruited in San Bernardino county, California; in its native habitat it commences to bear fruit in the second or third year of its growth. It is indigenous to Tropical America, and was carried to Asia soon after the discovery of America, and is now cultivated in nearly all tropical countries; this is one of the species which readily sprout from the roots when cut down by frost. In some of the West Indies, this fruit, in its season, forms almost the sole sustenance of the poorer class of inhabitants. While not equal to *Anona Cherimolia*, it is considered one of the finest of fruits; it is too soft for transportation when in its best condition for eating; the unripe fruit is sometimes cooked with ginger, to counteract its astringent qualities.

Anona reticulata, "Bullock's Heart," so called from the form of the fruit, (this common name is, however, misleading, as it would apply to several species) is indigenous to Brazil, and has been in cultivation about 200 years. It is considered as next best to *Anona squamosa* in quality, and is the true "Custard Apple."

Anona glabra the "Wild Custard Apple" of South Florida, is said to be indigenous to Florida and the West Indies, has fragrant fruit of the size of a pippin apple, and ripens in August. It is also called Pond Apple, and by the Spanish-speaking people Mamon.

Anona pyriformis and *Anona glabra* are said to have fruited in San Bernardino county, California, but I have not been able to find any description of *A. pyriformis*.

Anona muricata, "Sour Sop," is a native of the West Indies, where it is a favorite. It is a large, green fruit containing a soft, white, juicy pulp, from which a cooling drink is made; it is one of the most beautiful of the genus, but is not so hardy as the other species. I have received seeds of this species from the Botanic Gardens of Trinidad, West Indies, but they sprouted and grew in transit, and this, with other accidents which befell them after their arrival, destroyed the whole consignment.

Anona longifolia, the long leaved Anona, is a native of Guiana, South America. The pulp of the fruit is flesh colored.

Anona palustris, "Alligator Apple," or "Cork Wood," from South America, has smooth, leathery leaves, large heart-shaped, sweet-scented fruit. In Brazil, the wood of this tree is used as a substitute for cork.

Anona paludosa is found in swamps, in the West Indies.

The Beriba, a species of Anona found in Brazil, is a quick growing tree, with large fruit, the flavor of which resembles that of the Cherimolia.

Anona montana. Among other species of Anonas, for which I am indebted to the director of the Botanic Gardens of Jamaica, I received specimens of the foliage of *Anona montana*, which grows wild in the Island of Jamaica. (By reference to the figures on Plate 4 the difference between this and the other species figured may readily be seen).

There are several species mentioned in various publications, some of which are doubtless local varieties, or synonyms of well known species. Among them are, *A. africana*, *A. cinerea*, (West Indies) *A. mexicana*, *A. trilobata* and *A. senegalensis*. The last mentioned has bluish-green leaves, and small fruits with dark-red pulp, the flavor resembling the *A. Cherimolia*.

[In Fig. 1 are seen outlines of leaves of different species of Anonas. At *h* is outlined a leaf of *A. glabra;* at *i A. reticulata;* at *j A. palustris;* at *k A. montana*; and at *l A. muricata*. Of these the *glabra* and *palustris* are from young and immature trees, but they serve the purpose of showing the forms of the leaves for comparison. Fig. 2 represents the various parts of a flowering branch of *Anona Cherimolia*, drawn from Nature, and reduced to one-half natural size, at *a* is seen a branch from a five-year old tree, grown near Santa Barbara, with foliage, flowers and unripe fruit; *b* shows an unopened flower; *c*, the upper side of flower, fully expanded; *d*, a cross section of similar flower, before opening; *e*, the under side of flower with four petals; *f*, a cross section of four-petaled flower. The flowers are white, slightly tinged with green, and very fragrant. Fig. 3 represents a ripened fruit from the same tree, the thickened ring or callus surrounding the stem at its point of attachment to the fruit, shown at *g*, is not apparent after the second year of fruiting, the stem being attached to the base of a deep depression, as in some apples.]

The Horn Fly.—An insect, known as the Horn Fly, has made a great stir in the world, and particularly among cattle. It can be kept away from the animals by the application of almost any greasy substance to the parts attacked. Thus, fish oil, tallow, or even axle-grease may be used, applied with a sponge. Tobacco powder dusted upon the affected parts will destroy the flies, and the worms which hatch in droppings, may be killed by scattering lime in the barnyard or field, and particularly in the shade of trees in summer where cattle congregate.

THE BACK YARD.

R. E. FORD, WISCONSIN.

A great deal is said and written about the care of the "front yard" and how to make it attractive. This is well, and I am always glad to read articles of that kind, for we cannot make home and its surroundings too pleasant. But I do not like the idea of fixing up the front yard neatly, while the back yard is left to take care of itself. As a general thing, back yards are in anything but a neat condition. I do not believe in having everything on the outside, or where it can be seen, fine and attractive, while within, or in places where we think it will not be seen, there is foulness and disorder. It is not consistent with the principles of honesty to do this. It encourages deceit in children, because it is an object lesson, from us of a rank kind of deceit. It is altogether wrong, and I want to put in my protest against it. I have long had the back yard, as it usually exists, in my mind as a text for a little sermon, but I have neglected to preach it. To-day I happened to get a glimpse of *such* a back yard that I feel as if the proper time for the preaching of my sermon had come.

The front yard, as I went through it to my neighbor's house, was neat and trim enough to suit the most fastidious. It seemed to say, "Look at me! I am an index of the character of my owner. He believes in neatness, in order, and practices what he believes." My neighbor was not in the house. They told me I would be likely to find him in the barn. I could save steps by going to the barn through the kitchen. I went that way. When I stepped into that back yard, I felt as if some one had struck me. I was surprised at what I saw there. It seemed to me that a little of all kinds of rubbish was there. Old tin cans, pans and pails that had outlived their usefulness, old boots, shoes, and rubbers, rags, ashes, potato peelings, cabbage leaves, bones, old newspapers, old straw hats, some rusty stovepipe, boxes and barrels, and "other things too numerous to mention."

The back yard was literally nothing but a dumping-ground for filth and refuse of all kinds. A spout from the kitchen emptied slops into a little sink-hole near the well, and from this filth arose an odor that was malarial in its suggestions. It was a breeding-place for fever and diphtheria, and I could only wonder that my neighbor's family kept such diseases at bay. Such a cesspool in a city where health laws are properly enforced would have been complained of, and the owner of the property would have been compelled to remove it at once. But the greatest wonder was that a man who had the least regard for neatness, or, to speak plainly, decency, should tolerate such a nuisance as that back yard. It seemed hardly credible that my neighbor, whose front yard compared favorably with other front yards in town, was the owner of this filthy place.

I could come to but one conclusion, and that was this: He did not keep his front yard looking well because he cared particularly to have it so on principle, or from an innate love of neatness, but simply because he knew his neighbors would see it. He wanted things to look well on the outside, but he did not care how that portion of the place looked which he did not expect them to see. I noticed, then, for the first time, that the back yard was surrounded by a high board fence. All this came to me like a disagreeable revelation of character, and I shall never have as good an opinion of my neighbor from this time on as I had before I went into his back yard.

For the sake of honesty and consistency, to say nothing of health and decency, let an era of revolution be inaugurated against the dirty back yard. Gather the rubbish together, and burn all that is combustible, and bury the rest. Of course it cannot be made as attractive as the front yard, because it has other uses, which interfere with its being made ornamental, but it can be made clean and kept so, and if that is done your children will not get the idea that you do not care how a thing looks so long as it is out of sight of your neighbors. It will be a potent argument to convince them that you are not a hypocrite. But so long as you neglect it, and make it a dumping-place for filth and rubbish, they will not have faith in you, and you do not deserve their respect as an honest man. Your front yard preaches one thing, while your back yard testifies against you and convicts you of deceit and dishonesty.

PÆONIES.

To succeed with pæonies, the plants must be well cared for; they require direct, full sunshine, and a deep, heavy soil. Yet they may do fairly well in a light soil. In either case, the soil must be worked well and often. We frequently find a clump in dense shade and so completely covered with grass that the plant is scarcely visible. Is it a wonder that we are told the pæony is running out, that it does not flower as it did twenty years ago? Of course not. How can it thrive when the trees and grass have robbed it of food, sun, and air? In the nursery, where it has a chance to breathe, and is cultivated

FIG. 1. TREE PÆONY.

with care, it is the same generous, magnificent old bloomer that was everybody's favorite fifty years ago. When once well planted, it need not be disturbed for many years, but every autumn it should be given a liberal mulching, to protect it against hard frosts. This mulch should be carefully worked into the soil as soon as growth commences in spring, and, if grass and weeds are not allowed to intrude, one of the most beautiful objects that ever decorated a garden will be the result.

The old herbaceous pæonies are too well known to require description, but there are one or two species, not generally known, which are entitled to a place in every garden. One is *P. tenuifolia*, the Fern-leaved pæony, a native of Russia. The fine, fern-like foliage of this species renders the plant a beautiful object independent of its beautiful crimson flowers, which are the first of its class to appear in spring. The flowers of the original species are single. There is a double variety of it, which is much used by florists for forcing, and is a very attractive plant. For the border it is equally desirable.

The other species, which is rarely met, is *P. Moutan*, or Tree pæony, of which there are many varieties. It is a native of China and Japan, being found in great abundance on Mount Ho-an, where it is reported to grow to the height of ten feet. There is a large number of varieties, with white, pink, scarlet, magenta, purple, and mottled flowers, which are mostly single or semi-double. They are the first of any of the varieties of pæonies to flower. Grown in pots, they may be forced into bloom during the winter, and make excellent plants for conservatory decoration. These are more difficult of propagation than the herbaceous species, and are increased by grafting on the tubers of the latter kind. There is scarcely a situation where the tree pæony will not thrive. After planting, it should be left severely alone, taking care that other plants do not trespass upon it. Then it will gradually develop into a tree-like shrub, from four to six feet high, and produce an immense number of flowers, from five to eight inches in diameter, a full-blown specimen of which is shown in Fig. 1. In Fig. 2 is represented a flowering stalk of the Fern-leaved Pæony.

OXALIS FOR THE GARDEN AND THE HOUSE.

C. L. ALLEN.

Much attention is being given to the various species of **Oxalis**, and they deserve all, and more than all, that has been said in their favor, as being adapted to the window-garden. There is but one essential, other than a warm situation, that they require, viz.: sunshine. This they must have to develop their flowers, and it is useless to undertake to grow them without it. The species differ widely in their habits and manner of growth. Some are annuals, some herbaceous perennials, some greenhouse shrubs; many have tuberous roots, other bulbs; some are tender, others perfectly hardy. The flowers differ as widely in form and color as the plants do in their manner and habit of growth, but are always beautiful. The leaves vary considerably, but are mostly trifoliate and slightly acid. Prominent among the Oxalis adapted for house culture is *O. floribunda*, of which there are two varieties, one with white, the other with pink flowers, both of which were introduced from Brazil in 1829. This species is fibrous rooted, but the crowns are susceptible of division to an almost unlimited degree; the smallest piece having a single eye, started in spring, rapidly produces a plant that will bloom in the house the entire winter. Plants from a single eye will, in one year, fill a pot six inches in diameter and give at one time fifty spikes of flowers, and continue its bloom more than two-thirds of the year. The plant requires but little rest, indicating when this is needed by the color of its leaves. Rest should be given by withholding water, excepting at rare intervals, when only sufficient should be given to keep the soil from getting dusty. After a few weeks' rest the tops should be cut down to the crowns, which may then be divided, or the plant shifted into a larger pot, and started into growth. (A flowering plant is seen in our engraving.)

FIG. 2. FERN-LEAVED PÆONY.

Of the bulbous species, *O. Bowiei* is one of the most desirable, although it does not continue in flower as long so some of the others. The flowers are fully an inch in diameter, of a beautiful rose color, and come in large clusters on long stems. The varieties of this species, one of which is nearly white, are, by no means as beautiful, or useful, as the type. For the window-garden or conservatory decoration, *O. cernua* is to be preferred. This

OXALIS FLORIBUNDA.

species is a native of the Cape of Good Hope, as is the preceding. The bulbs are small, not much larger than peas, but if three or four are planted in a six-inch pot, the plants will completely fill it and give an immense number of golden-yellow flowers, which are produced in terminal clusters on long, slender scapes, that fall gracefully over the edges of the pot. For a hanging-basket, this species has no equal, but it is useless to attempt to grow it unless it can have full sunlight. For the open border, for the edging of beds, *O. lasiandra* is a charming plant; its flowers are pink and its foliage is unique and abundant, forming a mass a foot high and nearly two feet in width, equaling in beauty many of the popular plants with ornamental foliage. These bulbs are not hardy, and must, during the winter, be kept dry and secure against from frost.

For indoor culture it is best to secure bulbs that have been grown in this country and have flowered during the winter, resting in summer. Those usually sold have been grown in Holland during the summer, and naturally need rest in winter when we want them to bloom. This fact will account for the disappointment experienced by many who have attempted to grow these bulbs.

EDGING PLANTS.

E. E. REXFORD.

I am often asked to give a list of good edging plants, by those who desire to have a few beds on the lawn. Below I name and give a brief description of a few that I have found well adapted for this purpose. It will be necessary to order them at the time the plants with which the center of the bed is filled are ordered. They cannot be grown from seed and made effective.

Alternanthera. Often called "Rainbow" plant, because of its varied and brilliant colors. It is of easy culture. Plants should be set about six inches apart.

Achyranthes. One of the best because of its vivid crimson color. Should be treated like the Alternanthera.

Golden Pyrethrum, or Golden Feather, as popularly known. A good yellow. Excellent for massing where this color is wanted. Not surpassed, I think, by

Coleus Yellow Bird, which is the only other plant of this color which compares with it.

Coleus Verschaffeltii. One of the first varieties of this plant to come into popularity, and still one of the best, if not the best, where a dark crimson or maroon is wanted.

Geranium Madame Salleroi. If I could have but one plant for edging a bed, it should be this. It grows only eight or ten inches high, forms a compact, rounded mass of foliage, and retains this form all through the season without any attention in the way of clipping. Its foliage is a light green, edged with white, and a row of it is very pleasing in connection with other plants, because of contrast in color. All the other geraniums having a white variegation are comparative failures for bedding use, but this is perfection in every way. Among flowering plants of a habit of growth suitable to this purpose, I consider the

Dwarf Ageratum one of the best, because of its thick, low, compact form. Its lavender-blue flowers are borne in such profusion that they almost cover the plant, and by them we get a color for pattern or ribbon work that we can get from no other plant.

Sweet Alyssum is useful for small bloom, if kept properly clipped.

In order to succeed satisfactorily with any of these plants, they must be clipped frequently to prevent them from taking on a straggling or uneven form. Clipping not only keeps them in shape, but causes them to become thick and compact, because it forces them to throw out many more branches from the base or lower branches of the plant than they would be likely to do if not cut back. One of the chief beauties of these plants, when used as edging, consists in their neat, trim appearance. The Coleus is the rankest grower of all named, but plants should not be set more than eight inches apart. Mignonette is not only pretty for edging beds of annuals where a formal effect is not cared for, but it is so fragrant, and so useful for cutting that I prefer it to anything else for this purpose, in this part of the garden.

The Mosquito.—Many people unwittingly invite the mosquito to take up its abode with them, and to torment them. The mosquito, as soon as the season is sufficiently advanced, deposits her eggs in a boat-shaped mass, on the surface of some standing water, usually in a pond or rain-water barrel. There they hatch out, and are known as "wrigglers." In this larval form they do a great deal of good, by clearing the water of impurities that, if allowed to remain, would in many cases have caused malaria. They remain in this and the pupa state about one month. In the latter form, under a thin, waterproof covering, wings and legs have been developed. At the proper period the pupa case cracks open along the back, the mosquito straightens up, standing upon its spread mantle, floating like a fairy boat on the water, and when its wings are dried it flies away. The female mosquito does all the blood-sucking and singing, as the male mosquito is a very quiet fellow, his head decorated with two large, beautiful plumes. He spends most of his time in the woods, swamps, and the bushes and reeds along streams.

SUMMER DECORATION OF PARLOR AND GREENHOUSE.

R. E. ELMER.

Greenhouses are often unattractive places during the summer months, especially small, private ones. Most of the plants are put outside, and the remaining ones are without flowers. There is no necessity for this. We have some very fine summer-blooming plants that can be grown in the greenhouse better than out of it. With very little trouble we can make the benches gay.

The Gloxinia is one of the most magnificent summer-flowering plants we have, and it is especially adapted for greenhouse culture, as it requires considerable shade, a rather moist atmosphere, and shelter from winds. These requirements can all be met under glass. Proper shade can be given by whitewashing the roof, or by stretching thin muslin across the rafters. I prefer this plan, as it is easy to remove the cloth, in the fall, but it is not so easy to remove whitewash. The soil for Gloxinias should be light and porous. Leaf mold and sand is good. So is turfy matter and sand. The pots should be well drained, as a wet, heavy soil soon brings on a condition very unfavorable to healthy growth. Plenty of air should be admitted at all times, but the plants ought not to be exposed to a strong draft. A well-grown Gloxinia is a beautiful sight with its scarlet, crimson, pink, purple or pure white flowers. Many choice varieties have combinations of these colors, some in spots, some in a border, and still others in peculiar markings of the throat. Some are erect, others drooping. They have a thick, waxen texture of petal, with a velvety "bloom" that is like that on the cheek of a ripe peach. On good plants, the foliage ought to be six inches long by four inches across, and half cover the pot in which they grow. The leaves are very delicate and easily damaged, therefore, plants must be handled with great care. While they are fond of moisture, they prefer to receive it through the atmosphere, rather than in applications of water to the foliage. I have frequently known plants almost spoiled by showering. Nearly all thick, hairy-surfaced foliage is injured by allowing drops of water to stand on it. This is sure to be the case if the sun is allowed to shine on the plant while wet.

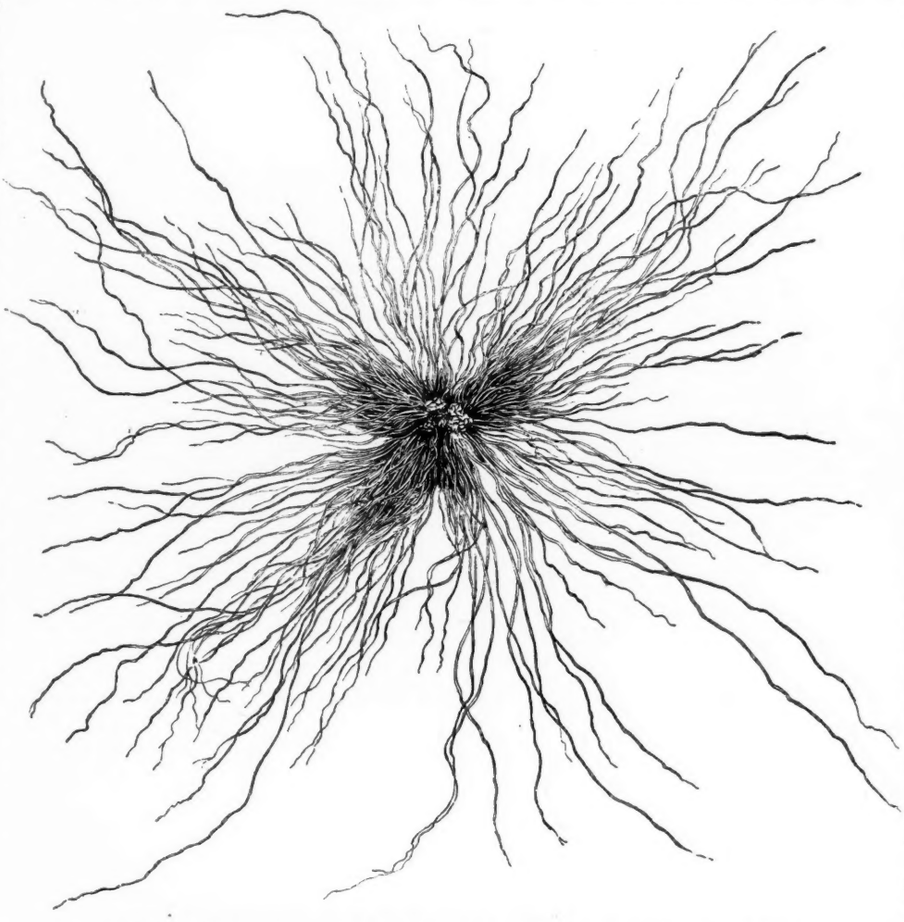
The Fuchsia is another of our very best summer-flowering plants. If given the care it requires, nothing can excel it in profusion of bloom. Well grown specimens will often show hundreds of flowers at a time. To grow this plant well, plenty of water must be given both to the roots and to the top of the plant. If neglected and the soil gets dry, the leaves often drop and the plant receives a severe check, from which it takes a long time to recover. Frequent and profuse showering of the foliage keeps the red spider from injuring the plant, and helps to bring about a luxuriant growth of foliage. Next in importance is plenty of root room. If the plant becomes pot-bound, the result is often similar to that following neglect to give sufficient water—the leaves and buds drop, and the plant is checked in its development. Therefore, frequent shifts must be made. The third requisite is shade. I have yet to see a Fuchsia do well in strong sunshine.

As the plant is a rapid grower and a very free bloomer, the nutritive qualities of the soil are soon exhausted; therefore, in order to keep the plants in good condition for blooming during the fall, liquid manure should be given about once a week, after the middle of July or first of August. It is also well to go over the plants about this time and cut them in somewhat. Shorten the branches on which the most flowers have been borne. The effect of the liquid manure will be to stimulate new growth, and on the new branches large and profuse quantities of flowers will be borne. To have a Fuchsia look its best, it should never be fastened down flatly to a trellis or rack. Give it the support of a stout stick—better, an iron rod—and tie the main stalk to it, but let the side branches take care of themselves. They will droop gracefully and naturally, and give you a beautiful plant, but tie them down and you spoil all individuality, and deprive the plant of that freedom which it must have in order to be its own beautiful self.

HOW ASPARAGUS ROOTS GROW.

The unusually heavy spring rains in Illinois caused the Piasa river to overflow its banks, and sent a current rushing through the extensive asparagus fields of E. P. Kellenberger, in Madison county. The accompanying engraving accurately represents a birdseye view of one of the washed-out asparagus plants, as sent to us, reduced to one-thirtieth part of its actual size. The crown is four years old from the seed, and the horizontally spreading roots cover an area thirteen feet in diameter. Each root begins at the crown and extends, horizontally, from five to seven feet, with about the thickness of a lead pencil. Mr. Kellenberger states that none of the roots grow downward, all growing sidewise, but little deeper than the crown itself, and radiating from the center like the legs of a huge spider. These roots are storehouses of food.

Asparagus grows wild on the fertile salt marshes of the shore line of Europe, on ground but a few inches above the tide water which permeates the sandy subsoil. As the roots will not live in water, they naturally grow to long distances parallel with the surface, and retain this habit when cultivated. This tendency of the asparagus root is well shown in the illustration. The usual practice of digging deep trenches for this crop does not seem to be well founded, and probably is useful only for drainage. The grower of the specimen portrayed in the engraving claims that asparagus does not root deeply, but that the crowns must be planted at least six inches below the surface, and not less than three feet apart each way, as even then the plants will soon crowd each other. The illustration plainly shows why the plants should not be set close together, as the long roots spread from five to seven feet in every direction. Shallow-planted asparagus sprouts somewhat earlier, but soon exhausts itself, sending up spindling, tough shoots, while the deeply-planted crown produces large and succulent sprouts throughout the season. The tenderness of the sprout depends upon the rapidity of growth, and both this and the size of the shoot depend upon the vigor of the root. Hence the great necessity for strong roots, which will send up large buds, and withstand the loss caused by their removal. These strong roots are built up by the leaves which grew the previous season, elaborating the food materials gathered from the soil by the long roots. The root needs feeding room, and the leaf needs air-space and sunshine. The roots store all the food of the asparagus sprouts.



HORIZONTAL GROWTH OF ASPARAGUS ROOTS.

The soil preferred is a sandy loam, or a wash from higher land, thoroughly underdrained, either by a porous subsoil or by artificial drains. The surface soil cannot be made too fertile. Manure is applied in the spring, not in the fall, and is scattered evenly over the entire surface to supply the long roots which reach out as feeders in all directions. Asparagus grown in such soil, with such treatment, is a source of satisfaction to the consumer, and returns a good profit to the grower throughout the season.

MAKING GLAD THE WASTE PLACES.

F. H. VALENTINE, NEW JERSEY.

The results that may be secured from the utilization of waste places by planting them to fruits, flowers and vegetables, are often surprising. Besides the pecuniary returns, the gratification of seeing the barren or weed-infested spots bud and blossom, and bear fruit is great. The saying is as true in regard to the soil as it is trite in general, that nature abhors a vacuum; and, unless the soil be occupied with something useful, it will surely bring forth a crop of unsightly weeds. How much, in this direction, may be accomplished with a little effort, was evidenced by a last season's experiment.

A board walk, parallel with the south side of my dwelling, left a strip of earth less than a foot in width uncovered. At one end, a moon flower was planted so that it could be trained over a porch. Later in the season, its beautiful white and fragrant flowers were a daily—or rather nightly—delight for many weeks. Next this, a number of tomatoes were planted, and, as they grew, were trained up the side of the house by strings. The warm, sunny exposure suited them perfectly, and they bore and ripened a great many splendid fruits, until long after the frost had killed those in more exposed situations. Nor was there much rot, though fruits on similar plants a short distance away in open ground rotted badly. It was a real pleasure to pick them as they hung in the air, clean and sound. Besides the tomatoes, there was a row of pole beans, which twined on stout cord, extending from nails driven into the edge of the board walk up to the side of the house as high as I could conveniently reach. In a short time, these formed a solid green wall, loaded with great fat, clean pods, filled with delicious, waxy beans. Meal after meal this short row furnished us, besides a quantity saved for seed. Earlier in the season, lettuce and radish seeds had been scattered, indiscriminately, over a part of the surface, and for many days these furnished an abundant family supply. The little strip, perhaps thirty feet long, furnished a supply of the best quality of vegetables, that would have cost several dollars if purchased, and the satisfaction derived amply repaid all the labor. There are thousands of such spots that could be easily and profitably improved in a similar manner. But in addition to the profit thus derived there is the pleasure of caring for the plants, and the satisfaction of gathering and eating vegetables of one's own raising.

One of the best things to plant near old or unsightly buildings is a grapevine. No place is better, if the soil be suitable, then the south side of a building. If there is only soil enough to hold the roots, that is all that is needed. A grapevine may even be planted in a paved yard, if a stone is removed to plant it, and then replacing the stone so as to leave a place for the cane between the stones. It is little work to train the vine up the building, and the fruit thus secured will be ample compensation for all the labor expended.

HOUSEHOLD

Our Nearest Neighbors.

MARTHA CLARK RANKIN.

Many seem to consider a course in ornithology necessary before they can love the birds, or even make their acquaintance. Thousands of men and women have spent their lives among fields and gardens without ever learning to distinguish a dozen of their feathered neighbors, while the city folks, with their many summers of leisure in the country, are not much wiser. Many of them would like to call by name the birds which they daily see and hear, as well as to know which live in the woods, the meadows, and the swamps. Perhaps they have made an attempt to learn but have been discouraged by the amount of technical knowledge which seemed necessary, and for which they had neither taste nor time. Or perhaps they have read a magazine article of some enthusiast who gives whole days to the study of a single bird, and considers no sun too hot, no rain too wet for his purpose. Knowing that a headache will surely follow their exposure to scorching heat, and rheumatism the drenching rain, and remembering their lack of leisure, they sigh and give up the project as impracticable. It would be well for such people to remember that though they cannot be distinguished ornithologists yet they can enjoy a great deal in the acquaintance of the birds.

Two friends were driving in the vicinity of Saratoga when one suddenly exclaimed, "Oh, look! the bobolinks are back. Just hear them! And handsomer than ever too. Isn't that shining black and white fellow a beauty with his buff epaulets? Now I feel that summer is really here."

The other looked up in amazement. She had been greatly interested to learn that their acquaintances, the Winthrops, were at home again after a winter abroad. But as for the Bobolink family their return was not only a matter of indifference, it had not even been noticed. Yet the chance remark was not forgotten, and to its influence may be traced the writer's acquaintance with the birds of her own neighborhood. It was humiliating to find, at the outset, that the robin and crow were the only birds that could always be distinguished at a glance; but a little questioning of acquaintances proved such ignorance to be quite general.

Prof. Coues's "Key to North American Birds" was the first book consulted; and, although evidently invaluable as a handbook, it was somewhat discouraging to be told that a beginner ought to shoot every bird he can, even if he accumulates as many as fifty of a kind. But these directions are intended for collectors only, and those who simply wish the birds for friends will do better to heed Solomon's advice, "A man that hath friends must show himself friendly."

After observing as carefully as possible the size, color, song, and manner of every bird seen, an attempt was made to find it among the descriptions of the "Key"; and though often unsuccessful every search revealed something new. It was not always possible to tell whether the hind toe of a bird was inserted above the level of the rest or not, and recollections as to size and length could not be wholly accurate. However, it was generally possible to decide whether the bird was a singer or not; and then, by working carefully down, through order and sub-order, twenty of the commonest birds were, in the first season, traced to the species.

These twenty are to be found almost everywhere, and although there are others equally common, which another observer might notice first, yet surely everybody ought to be familiar with them. As a novice is always first attracted by the color of birds, it seemed natural to group them in this way: Under "Blue" were the bluebird and jay; "Yellow" included the Baltimore oriole, goldfinch, meadow lark, and highhole; "Red" the purple finch and scarlet tanager; "Black" the grakle and red-winged blackbird; "Black-and-white" the bobolink, chickadee, and king bird; "Slate color" the phœbe and cat bird; "Reddish-brown" the wood thrush and thrasher; "Sparrow color" the song, chipping, and vesper sparrows. The long winter followed, and added only two friends to the list; the lively little *Junco* or Eastern snowbird, and the daintier but more shy snow bunting.

Late in March the bird season reopened with the bluebird's "hesitating note upon the breeze"; and for the next two months opportunities for bird study were limited only by lack of leisure. One morning the crabapple tree suddenly blossomed with a flock of purple finches; the next a solitary redpoll linnet held full sway. Then came the redstart, the crown sparrow, the chestnut-sided warbler, the oven bird, and a dozen others that would not at any other time be found so near a house. Only one who in mature life has suddenly awakened to the consciousness of the bird migrations can realize the succession of surprises which that April and May unfolded.

And to think that any one should miss all these delightful sights and sounds! Although boys and girls have by far the best opportunities for such a study, yet grown men and women have frequently begun in ignorance and found themselves from the first more than repaid by the constant rewards of the quest. Even though your home be in a great city you need not despair; for the birds consider the city parks to have been made for them, and they nest by hundreds in the trees and shrubs. Then, too, with your eyes open you will find more birds in your own yard than you had dreamed of, even such beauties as the tanager, downy woodpecker, and oriole. You will never again lack an object for walk or drive, and you will think attractive, places which would otherwise seem barren and forlorn, till soon you will exclaim with Thoreau:

> "I hearing get who had but ears,
> And sight who had but eyes before."

A Bride's Household Belongings.

CARRIE MAY ASHTON.

Perhaps a few words to the brides, who are getting things ready for housekeeping, will not come amiss. One writer says: "Allow at least five sheets, one pair of blankets, two comforters and a spread for each bed. Provide an extra spread for every two beds and then they can be washed, turn and turn about." For sheets, the double width, which does not require a seam in the middle is best. The forty-inch unbleached is, of course, much less expensive, and wears well, but requires a seam in the middle. Pillow-shams are made of fine linen, hemstitched and embroidered in white rope silk or in linen floss. Others are trimmed with Irish and Venice point around the outside instead of hemstitching. Bath cloths more commonly called washrags, can be bought by the yard or piece, and should be overcast all around, and then finished with a pretty edge crocheted of white cotton. Made in this way, they last much longer than as if they were left to ravel. Some prefer to knit or crochet them of cotton, in some plain stitch, but it seems like a waste of time to put so much work on a little thing.

Bureau and washstand scarfs are of linen, hemstitched or fringed, and done in outline work. Mats for the brackets on the bureau can be crocheted of white and colored zephyr in whatever color the room is furnished. A pretty pair have the foundation of white yarn, and are rounded to neatly fit the brackets. White saxony is used for the fluffy edges. Fourteen stitches crocheted very loosely are put in each stitch around the edge, then the next row inside has twelve, the third ten and the fourth eight. Into the center of each of these is crocheted the same number of stitches in pink saxony. In regard to the quantity of table linen, that depends upon how much you expect to entertain. Five tablecloths, three for every day, and one dozen napkins, one fringed teacloth, with napkins to match, and one long, fine one for company will answer very well to commence with. A dozen and a half of the large napkins, seven-eighths, as they are called, will be needed for company, and a set of fruit napkins to save the others. Many prefer to purchase for everyday wear the unbleached in pretty patterns which wear well, and are very pretty in their brownest tint. Much of the new table linen is hemstitched. A cover of felt or canton flannel is needed to put under the cloth, and makes a table look much nicer. Six or seven tray-cloths will be needed, and can be purchased already hemstitched, fringed and stamped ready for outlining, or they can be made at home from web linen. The fine German linen is much used for these, at present. Others are of handsome damask. Conventional designs are the latest thing for the outline work, which is done in white silk or linen floss. Red is used for everyday wear because it washes so well, but white has the preference. Carnation pinks, yellow and pink roses, buttercups and daisies, are seen on many of the beautiful tray cloths and overlays, in their natural colors. Sideboard scarfs are of Momie linen or the plain German, and made in similar style. Doilies are round and square, either fringed or hemstitched, and as dainty and pretty as it is possible to make them.

Everything should be marked with the maiden name of the bride. My advice to brides, is to have everything as nice as possible, but do not spend weeks and months making enough things to last half a lifetime. Better spend your time outdoors in the glad sunshine and fresh air, or in reading good books. A young man was heard to say not long ago, it looked as if a girl never expected to have anything more when she laid in such a supply of clothing and household linen. Whatever you buy, be sure that it is a good article. It is poor economy to buy cheap goods.

The Hired Men on a Farm.

ADDIE ARCHER.

Do the young men consider it beneath them to follow another man's plow, as some of their sisters do to wield another's broom? In some places help, either good or poor, is very difficult to find. The farmer's work is impeded, and he suffers much annoyance. Cheap help is often the dearest in the end. Temperate, honest, neat men who will work faithfully for the farmer's interest deserve good pay and proper respect. A slovenly-looking man who will talk familiarly with the family and help himself to the butter with his own well-licked knife, is enough to take away an appetite at the table. Where there is more than one hired man—for a single one might take offence—it is better for them to eat by themselves, be nicely waited upon, and then go about their work. Then the table can be straightened a bit for the family who will enjoy the freedom of table talk that the men might misinterpret if inclined to retail family affairs.

The men should be kind to all animals. Nothing arouses the righteous indignation of wives and daughters so much as cruel, abusive treatment of animals, yet on many farms the hoe handle or milking-stool is broken over an animal's back. If the wife or daughter tells a hired man to stop beating a horse or to lighten the load, she only receives a disrespectful answer. The farmer doesn't care to investigate. In fact he hasn't courage to protest because he is afraid the offender will leave. Where is his dignity and tact?

A farmer should be careful about the private character of the men he employs, remembering that his family, especially his growing sons, will necessarily come in contact with them. If Johnny or Teddy are at work, or at play in the field with the men, let their father know if the conversation be such he should wish them to hear. If not, he must be brave enough to forbid improper talk before them. Let the daughters, however young, be thoroughly protected, never subject to rude jest, or coarse flattery. The daughters should maintain a ladylike deportment that may save them future annoyance. "Familiarity breeds contempt," is often sadly proved with hired men. If there be a hired girl in the family, she should not be the subject of rough jokes and tricks. The master of the house, or farm, should not give out his orders for working while the men are eating their meals. Some men think it a waste of time to talk business affairs five minutes aside.

The men's rooms should be comfortable and contain the necessary toilet articles, however cheap. They should be allowed time to milk neatly. Careless milking makes "cowey" milk. A bit of looking-glass might be placed in the barn to tell if old Brindle left an ugly streak on the face when she struck it with her tail. In warm weather it is a convenience to have a place for washing the more offensive dirt from the hands before coming to the kitchen-roller towel. If the boots are swept

with an old broom and the cow hairs brushed from the clothing with a whisk broom, much odor will be kept from the dining-room.

Children's Outfits.

CONSTANCE B. WHITE.

The large prices demanded by importers and dealers in children's and infants' French garments places them beyond the reach of parents of moderate means. Yet with a little properly directed knowledge and skill parents may be enabled to clothe the little family handsomely and inexpensively. The materials are comparatively cheap, and with a little patience these garments may be copied directly from the French models brought over twice a year by the importers. Of course, to produce a truly handsome result only the finest grade of material must be employed. The apron illustrated in Fig. 1 is copied from a French importation. Its cost, as will be seen by the table is $2.27, while the retail price of the importer is more than three times this amount.

The apron is for a little girl of one year, and may be enlarged for children up to the age of five. The yoke is composed of fine insertion three-fourths of an inch wide, the ends dove-tailed and the half-inch edging for the neck joined to this by means of a feather-stitched band of nainsook one-fourth of an inch wide. The skirt is made of sheer nainsook, and is eighteen inches long when finished. This is also joined to the yoke by a feather-stitched band corresponding to the upper edge. Take two widths of nainsook, one for the

FIG. 1. THE MAY-QUEEN APRON.

front and cut the other in two for the back as it is open the entire length. Turn a narrow hem on the back and slightly gore the sides of both back and front. Cut out a little under the arms the same as for a yoke dress, and gather the top of the skirt before sewing to the yoke. Put a hemstitched hem three inches deep in the bottom and make three tucks one-sixteenth of an inch in

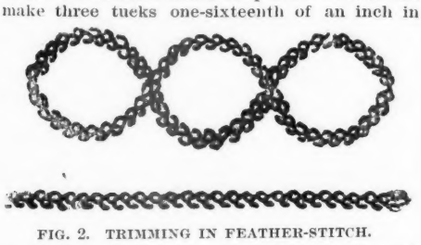


FIG. 2. TRIMMING IN FEATHER-STITCH.

depth. Then work a row of single feather-stitch in the form of a figure eight. This can be done by first marking with a lead pencil using the top of a cotton spool, No. 150, and following on one line, afterward taking the other. (See illustration, Fig. 2.) When this is done make three more fine tucks and finish the armhole with a gathered ruffle of embroidery and the feather-stitched band. Three fine pearl buttons are sufficient for the back. It is best to make the yoke first (as the back and front are exactly alike with no seam on the shoulder) and fit it on the child as it must fit perfectly. Cut the embroidery for shoulder-straps and front-piece ten and one-quarter inches to allow for joining, and the back pieces five and one-half inches to allow for a one-fourth inch hem and lap. The quantity and cost of material will be as follows:

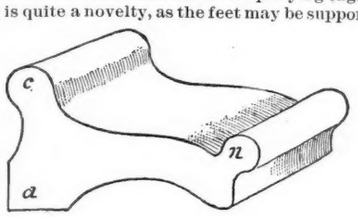
1¼	yards nainsook at 90c.	$1.13.
1½	" insertion at 30c.	.34.
2	" edge at 30c.	.60.
1	spool crochet cotton No. 24 at 8c.	.08.
1	" each of 150, 100 and 80.	.12.
	Total	$2.27

This, of course, is to be entirely hand-made.

Rest for Tired Feet.

L. D. SNOOK.

The footrest shown in the accompanying engraving is quite a novelty, as the feet may be supported

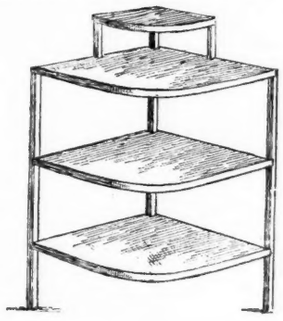


A NOVELTY FOOTREST.

at four different angles or elevations. The sides are made from inch boards, cut in the form shown. The distance from the bottom, at *a*, to the top of cushion, at *c*, is fourteen inches; the diameter of cushioned rolls, *c* and *n*, is five inches. This makes an agreeable size for resting the feet or limbs upon, the width being fifteen inches. The cushions at *c* and *n* are conveniently located, while the intermediate cushioned space makes a nice seat for the little ones. The total length of the sides is eighteen inches, and when a higher elevation for the feet is desired, simply raise the end, at *n*, letting the point, at *a*, and the side of cushion, *c*, act as the base. By simply turning the side of this page upward you will get the correct position of the footrest when reversed, as indicated.

A Homemade Corner-Shelf.

A very cheap and quickly made corner-shelf, or shelves, is shown in the accompanying illustration. The three large shelves are made from boards from 18 to 20 inches in width, the front rounded as indicated. The two front supports or standards are three feet in length, and one and a half inches square. The back standard is the same size, only 10 inches longer, the short standards being ten inches long and and one inch square. This arrangement is to be set in a corner. The top shelves and front are draped with cretonne. The upper shelves are used for lamps, books, etc., the lower



TO STAND IN A CORNER.

shelves for the work basket, books, papers and many other things. The whole outlay for lumber and cloth need not exceed 50 cents.

A "Joss-Flower" Mat.

MRS. L. D. ELDER.

A pretty mat for lamp or vase may be made from white and orange-colored felt, in the form of a narcissus blossom. Take a circle of white felt of a diameter to suit the purpose for which it is intended, cut it into six deep, rather pointed scallops; in the center of this sew a cup of orange felt, which should be precisely like the peel of half an orange, and one-third as far across the top, as the white felt circle is across. A bulb-shaped vase, a bowl of china or glass just fitting into the cup of the mat, and filled with flowers, or used as a catchall is pretty. To imitate the "poet's cup" narcissus, edge the cup with crimson tinsel cord. The "hoop petticoat" and other forms of single narcissus blooms may be counterfeited by deft fingers, but the "Joss-flower" and "poet's cup" are the easiest and prettiest of all.

Canning Sweet Corn.

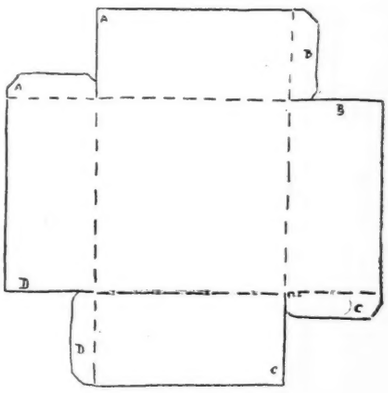
ELLA ROCKWOOD.

Cut the corn from the cobs and pack tightly into glass cans, using a round stick and pounding it down until the milk from the corn completely covers the corn when the can is filled. Screw on the covers tightly, and place the cans in the wash-boiler or a large kettle, and fill it up with cold water, to nearly cover the cans. Place some bits of board in the bottom, to rest the cans on. Boil steadily for six hours, then set aside to cool in the water. When sufficiently cool to handle, screw the covers down again, wash off the cans, and set in a cool, dark place. It is a good deal of labor, but corn kept in this way is very nice. Do not be tempted to shorten the time of boiling. I did so one year and the corn spoiled in the cans.

A Kitchen Convenience.

PALMETTA MONTCLAIR.

Meats that are covered while roasting are always more juicy than when the steam is allowed to



A BAKING-PAN COVER.

escape. If one has not covered baking pans, a very simple substitute may be made from heavy brown or white paper. Make it exactly like a pasteboard box, lap at the corners and fasten with a stitch or two; brush over with melted butter or oil. They can seldom be used a second time, but have the advantage of not costing anything. They can also be used for cakes and pies, where one's oven is viciously inclined to burn at the top.

Novel Conceptions in Shavings.

ANNA HINRICHS.

Woman's ingenuity has devised remarkable possibilities in the adoption of common, wooden shavings, for the fashioning of small, fancy articles. These dainty creations are unique, practical, beautiful, and within the reach of all. Select none but thin and regular shavings of various widths, both wide and narrow cuts being desirable. To render them pliable, soak in warm water, and handle while moist. Fig. 1 shows the detail for making a pointed scallop as an edging, a braided covering for supports and handles, and a twisted border. The body of any article is formed of wider shavings by weaving, alternately, over and under. Squares, triangles and circular pieces are readily woven.

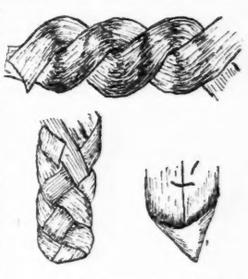


FIG. 1. SHAVING BRAIDS.

Where necessary, fasten with the least possible stitches. Edge with a light hat-wire, which allows the flat shape to be bent into any fanciful form. Handles for baskets, and the like, are of willow twigs, or strips of cardboard, covered with a plaiting of narrow shavings. Supports for baskets and photograph easels are of light wooden sticks, similarly covered. Full loops and bows with slashed ends serve as a garniture, and even flowers are imitated in shavings, on the same plan as of tissue paper. Fine, moist shavings are as pliable as French tissue paper, and petal and leaf are cut, curled and moulded with the same degree of perfection. The stems are of wire, covered by twisting with a fine, narrow strip of shavings. Stamens and pistil are made of thread or crinkled wire, in gold and silver. If preferred, color effects are produced with the requisite paints in water, oil, or metal, applied, of course, after the flower is thoroughly dry. The accompanying illustrations are given as suggestive of the practical application of the above directions. Fig. 2 pictures a wall-pocket, made of a woven square, wired, and fastened in triangular form. It is finished with a twisted edge, with loops, bows, and a cluster of daisies. A pretty use for this pocket is to hang it beneath a picture, and in it place a bottle, filled with water, in which is growing "Wandering Jew." A fresh, vigorous growth of refreshing green, from the depths of an etherial conception in creamy white is the gratifying result. Fig. 3 illustrates a simple design in box form, with blue silk bag-lining, that will answer innumerable purposes. The box is woven over a block of the desired size, wired, and finished with a full, looped frill of narrow shavings. It is further ornamented with a painted sprig of forget-me-nots, or a full bow. The work-basket represented in Fig. 4 is of more elaborate construction. Four sticks, covered with a plaiting, and bows, are fastened at the proper angles to form the support of the basket. The tray, or basket proper, is a woven square, with edge of pointed scallops, wired, lined with yellow satin, and bent in gracefully drooping curves. It is a receptacle dainty enough to grace the boudoir of the most fastidious. A charming fancy in this direction is a broad shaving to fasten diagonally across the upper left corner of the mirror. On it, in artistic gilt lettering, print, "Smile for smile, I give—and frown for frown!" One end is finished with loops, or a cluster of daisies, the other with a full bow. Never attempt to work with shavings unless they have been soaked and are still moist. This is imperative, even for the fashioning of a simple bow. The strip to be painted, or lettered, must be soaked, stretched smooth and straight, and held down by weights until perfectly dry.

FIG. 2. WALL POCKET.

FIG. 3. A PRETTY TRIFLE.

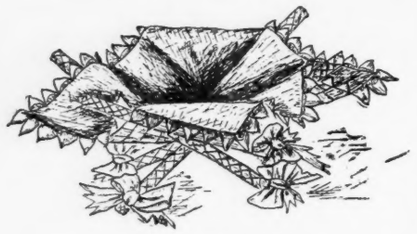
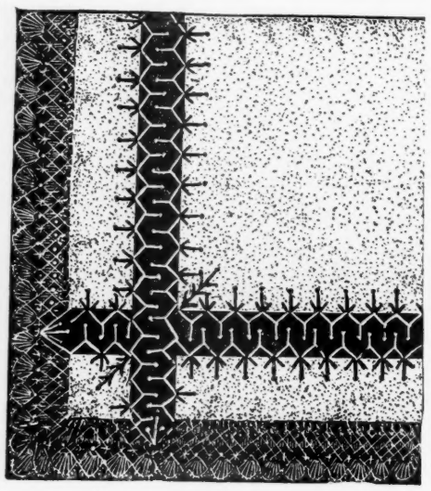


FIG. 4. WORK-BASKET.

Spring Afghans.

As spring advances there must be a change in baby's carriage wraps as well as its clothes. Art stores are ready to supply this demand; but if the same can be made at home why not spend a few hours in fashioning one of these dainty essentials to baby's comfort. The cost will be a third less at least. The eider-down flannels seem the most suitable for little babies' carriages. An easily-made one is of white flannel with a band of old-rose gros-grain ribbon held in position with a row of cat-stitching on either side done in heavy white silk. An extra stitch is added, ending with a French knot. Fan stitches are done in the old-rose silk from the top of the cat-stitch on the flannel. It is lined with old-rose India silk and finished around with white lace.



A BABY-CARRIAGE AFGHAN.

The Ideal Kitchen Cabinet.

CLIFTON W. WADY.

I have recently met with an unique piece of furniture, the possession of which would be heartily appreciated by every housewife in the land. It is the invention of Mr. H. C. Forbes of Boston, who has the only complete sample in existence. I have been permitted to photograph this in two views, cuts from which are here presented, showing the cabinet both closed and open "for business." The "Forbes' Ideal Kitchen Cabinet" is not for sale, and is not patented and its inventor, by this publication, waives all rights therein; hence the reader of these lines is at liberty to build, or have built, an article after this model. The one referred to above was constructed by a carpenter, and though more crudely put together than mill work, it is nevertheless just as servicable as if more expensive and elaborate. In dimensions the cabinet is seven feet in height; four feet wide and two feet deep. Clear pine, stained or finished in the natural wood, answers well. If built of hard wood and highly finished, the appearance will be improved, of course, and without increasing the cost very materially.

FIG. 1. CABINET OPEN.

The keeper of the country house, in general, will acknowledge the lamentable need of more pantry room and accommodation, and will hail with delight the possibilities afforded by the interior arrangement of this article. As flour, in such cases, is mostly purchased by the barrel, space has been reserved to receive a whole barrel at the right of the case of drawers, and a dust-tight cover renders the same accessible. A moulding-board is shown projecting over the top drawer in Fig. 1, where it is pushed in out of the way until wanted, when it is removed and one end inserted beneath the cleat placed within, for the purpose. A thumb-screw might be fastened beneath to be used in keeping the board firmly in place. The four drawers with metal pulls offer storage room for quite an amount of tablelinen, towels, spare cloths, etc. It is suggested that the top drawer be left for the bread knife, egg beater, meat chopper and similar articles, and it will be found none too large for those thousand and one little things which else are left about to be in the way when not wanted and entirely out of the way when most needed.

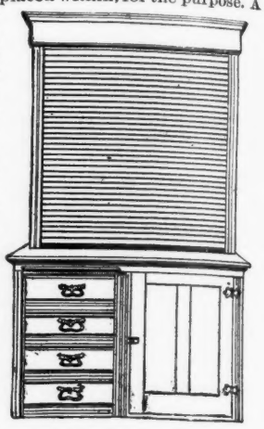


FIG. 2. CABINET CLOSED.

Any number of shelves may be put in, depending, of course, on the height of the space required between. They should be movable, however, and this end may be easily accomplished by fastening two "scalloped" uprights at either end to support a fitting cross-piece. A double row of small boxes or drawers is provided for spices properly labeled, and larger ones for tea and coffee. The shelves offer rest for many jars, cracker boxes, tinware etc. It may be well to add that where the flour is not put in by the barrel, it is designed that a dividing shelf be placed in the right hand cupboard, upon which a bag of flour may rest; the balance of space below being utilized for large cake box, iron kettle or something of the kind. The neat appearance of the cabinet when closed is illustrated in Fig. 2.

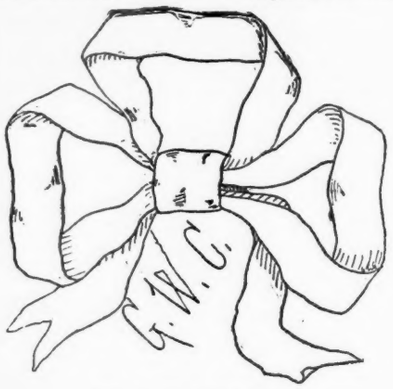


FIG. 1. THE LOVE KNOT.

Marking Table Linen.

ALICE CHITTENDEN.

Two very simple designs for marking tablecloths and napkins are given in the accompanying illustrations. The love knot (Fig. 1), so popular in wall papers, furniture covering, dress goods, and table damask is always pleasing. It should be placed in one corner of the napkin, just above the hem, with the top of the designs and letters toward the mid-

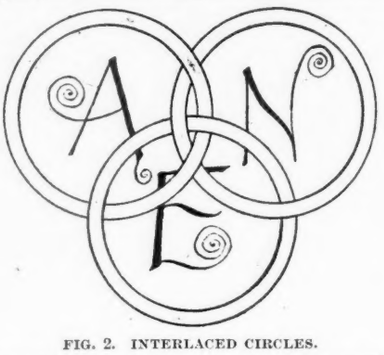


FIG. 2. INTERLACED CIRCLES.

dle of the napkin. In the case of a tablecloth, first lay the cloth on the table and draw the design so that it will come about in front of the guest who occupies the place of honor at the right hand of the hostess. Sometimes the same design is worked in the opposite corner, diagonally, so that the lady at the right hand of the host may also have this pretty device before her eyes. Work in raised satin or flannel stitch, and the initials in outline. White silk is preferable to colored, although the pink, blue, or gold silk is exceedingly pretty if you are sure of your laundress. Still more simple is that of three (or two in case you have only two initials) interlaced circles (see Fig. 2). For napkins use a two-cent piece, for tablecloths a dollar or half dollar. Work the circles in outline stitch and the letters in satin stitch.

For Summer Wear.

Bell skirts, Russian blouses, jacket bodices, round waists and a great profusion of ribbons! These are the leading features of this summer's styles, altered and modified to suit various occasions. In spite of the fact that plain, useful walking gowns —known as *robes trotteuses*—are made to clear the ground, the bell skirts of handsome dresses are still inconveniently long, with greater width at the foot than during the winter. The bias back of these are now often made without a middle seam, but, instead, fall in a flowing fold with a seam on either side. Most skirts, too, now have a narrow foot-trimming extending all around; a band with an upright, plaited heading, tiny ruffles, pinked-out ruchings, and the elaborate garnitures and moss trimmings sold for the purpose, all being in vogue. Russian blouses, with or without yokes, are extremely popular, either as the corsage to a suit, or else of contrasting material, to wear with different skirts. These fasten on the left side and are bordered down the opening and round the bottom. Some extend nearly to the knees and are said to be the forerunner of over-skirts; but the prettiest end about six or eight inches below the waist-line. The most truly Russian bodices are of bright blue, red, or tan wool, trimmed with lengthwise stripe wrought in cross stitch, but others, decorated with the new Muscovite embroidery, are very stylish. At midsummer, blouses of lace—black, white and écru—will be largely seen, and when made of deep flouncing lace, they are lined with thin silk and laid in full folds from a shirring at the neck to where the waist is belted in. The belt may be of broad ribbon or of silk doubled and interlined. The Russian capes, falling over rather full undersleeves are added to many of these blouses.

A new style of jacket corsage has three box-plaits down the back, belted by satin ribbons tied in the middle with upright loops and long ends; while the fronts are open and adorned with large buttons and buttonholes. This is worn over a short blouse of China silk of some contrasting color, which is confined by a corselet, attached to the skirt, whaleboned up the back and tapering to a rosette of ribbon in front. Other jacket waists have postillion tails, coat backs, or else are cut short off and finished by crossed bands of velvet. Round, gathered, or plaited, waists are long enough to extend below the skirtband and are worn with a wide girdle, corselet belt, or a Directoire sash which has short ends and two upright loops above the belt and one below.

Foulard silks are always favorites in warm weather and in these the changeable twilled fabrics now prevail, very dainty designs being shown of small white and cream-colored branches on a waved or shot ground. A French fashion is to wear skirts of these goods, with a jacket waist of cloth, the latter matching the most striking hue in the silk.

Ginghams and other wash dresses are fashioned with a belted waist having yoke and cuffs of embroidery; or else trimmed with the pretty cambric bands that are corded and scalloped on the edge with colors. The skirt should be fuller than for a wool gown and at least three inches longer in the back than in front.

At this season "sweet-girl graduates" are naturally much interested in white gowns, the snowy costumes in which they are to read those wonderful essays over which they have toiled so long and anxiously. Nothing will be prettier for a graduating dress than white wool crêpons very deeply crinkled; or, if preferred, a China silk or crêpe de chine might be chosen. Make with a high round waist fastened in the back, with long full sleeves, a yoke and bertha of lace and a girdle of white satin ribbon laid in several wide folds across the front, tapering narrower to the back where the ribbon is knotted with two upright loops, one drooping one, and two long ends. Have a bell skirt trimmed with two foot ruffles of the material, or one of lace; and complete the simple, girlish toilette with white silk stockings, and slippers and gloves of white undressed kid.

Older women will appreciate the black French grenadines that have a ribbed or dotted surface covered with semi-transparent disks. These are often made up over colored silk, preferably the changeable taffetas, and trimmed with colored jet. Chic little capes to be worn on cool days, and for driving, are of velvet gathered to a yoke of Irish lace. They are very full and scarcely reach the waist line. The same idea will likely be carried out in cheaper materials.

The later importations of hats display many high and fantastic crowns; the "Witch," the "Mother Goose," and the "Tyrolese" all being represented. The small straw excrescences, however, are set very far back and almost concealed by the bows of ribbon and feather tips massed on the front of the brim. In marked contrast are the extremely flat fancy braids that are loaded with flowers, both back and front, and often have a becoming row of jet beads outlining the edge. Long streamers from the back of round hats are much worn just now, but milliners say this is a purely American fashion and must soon become hackneyed. It is newer to place the garniture of a hat on the front and left side, rather than in the back.

Point de Gênes and other heavy laces are much used as dressy accessories for a plain dress. Gathered straight across, the lace is pinned on to fall like a bib in front, or properly arranged, forms a bertha or bretelles over the shoulders. Delicate little cravats of mull are also worn with both house and street costumes; these are quite inexpensive and are shown in exquisite shades of pale pink and green, as well as white, embroidered on the ends or fringed just enough to fluff.

To Stain a Floor.

E. M. LUCAS.

If the floor is new, the stain can be applied to it at once, but if it is old and soft it should first be treated to a coat of size. The glue can be obtained at any paint shop, and should be dissolved in water until of the consistency of thin gum, and then laid on with a brush. Light wood can be stained to imitate oak as follows: To every eight ounces each of potash and pearlash add one gallon of boiling water; apply this with a brush, working the way of the grain. A walnut stain can be made as follows: Use half a pound of dry Vandyke brown, one ounce of bichromate of potassa and five ounces of sal soda; dissolve in one gallon of boiling water and apply hot, as above. A dark stain can be made of permanganate of potash, which also serves to purify and disinfect the room. Dissolve an ounce and a half of the crystals in a gallon of boiling water, and use hot. A pair of heavy gloves should be worn while at work, as all these preparations stain the hands badly. Lemon juice and salt will, however, quickly remove any stains from the skin. If the color is not dark enough, the staining can be repeated when dry; when perfectly dry, linseed oil should be rubbed on freely with a piece of flannel, always applying it with the grain of the wood. Two or three layers of oil are an improvement and aid in setting the stain.

The floor is now ready to be polished. Cut some beeswax into small pieces, put them into a vessel over hot water, and pour over sufficient spirits of turpentine to cover it. Place over a slow fire until the wax is thoroughly melted, and then set aside to cool; when cool it should be of the consistency of pomatum. Rub on sparingly with a piece of flannel. It requires considerable "elbow grease," but after a floor is once well done it is a thing of beauty. It can be kept clean and bright by a daily dusting, and an occasional application of the wax and turpentine.

Those who like the more common varnished floors should stain as above, but instead of the linseed oil, apply a coat of size. When the size is dry it can be varnished with one or two coats of copal varnish, laid on evenly; if the varnish is too thick it will scratch easily.

Yellow pine of fine quality and grain can be finished to imitate oak without staining. Give the floor a coat of size, then one or two coats of japan, diluted with turpentine, allowing each to dry thoroughly. When dry rub with linseed oil. These floors require to be dusted daily, and to have a little linseed oil rubbed in occasionally. They require less care than a waxed floor, but when they get shabby, they are not so readily renovated. A flannel bag to slip over a broom is an admirable floor duster.

A Hot Weather Vegetable.

The possibilities of the cucumber, except for pickling or salads, are little understood. It is excellent in soup, as well as fried, stewed, stuffed, and many other ways.

Cucumber Soup.—Cut one large, or two medium-sized cucumbers into thin slices, strew salt over them, and place between two plates to drain. Put them into a saucepan, with a quart and half a pint of some white stock, either chicken or veal, and simmer gently, without reducing the quantity, for forty minutes. Season with salt and a little cayenne; thicken with ground rice, or arrow-root, wet with milk, and, as soon as it has boiled up, draw to the side of the fire; add half a pint of hot milk and the beaten yolks of two eggs. Serve at once. The safest way to add eggs to any hot liquid is to turn a little of the latter slowly into the bowl containing the yolks, beating the white. When the bowl is full, turn it all into the vessel containing the rest, still beating, and when thoroughly hot pour into the tureen.

Stuffed Cucumbers.—There are several ways of preparing these. Peel two large ones, and with a sharp knife cut out a neat piece from the side. With a small teaspoon remove the seeds, and fill with nice forcemeat of any kind; replace the piece, and tie securely with stout white thread. Line the bottom of a saucepan with thin slices of bacon and veal, lay on the cucumbers, then another layer of veal and bacon, three new carrots, scraped, three small onions, and as many turnips; cover with stock or water, and simmer until all are tender. Thicken the gravy and pour it around the meat and vegetables after they are neatly dished. Season, when about half done, with salt and pepper. Another way is to cut them in halves, take out the seeds, and fill with a forcemeat made of equal parts of bread crumbs and chopped marrow, well seasoned with salt and pepper. Tie the halves together, lay on a baking dish, nearly cover with meat gravy, and bake until tender. A good substitute for meat gravy is a brown drawn butter.

Cucumbers Stewed.—Peel and cut into quarters lengthwise, dredge with flour, season, and fry lightly in hot butter; put them in a saucepan, with some good brown gravy, and stew slowly until tender. Add the least trifle of sugar and a teaspoonful of vinegar to the sauce; thicken slightly, and pour around the cucumbers. Sometimes an equal number of small button onions are stewed with the quarters of cucumbers.

The Throne of Timour.

HELEN E. SMITH.

Many are the remains of ancient art whose origins seem to be lost past recovery in the mists of antiquity. In Southwestern Persia is a very remarkable work to which, without any apparent reason, the natives have given the name of Takht-I-Timur—"Throne of Timour." The work consists of a group of gigantic figures cut out of the solid rock in a perpendicular ledge in the side of the mountain bordering the road. The central figure is that of a king, sitting on a lion for a throne, with his courtiers in reverential attitudes about him. The whole is surrounded by a high, massive wall on three sides, while the mountain, out of which the figures were cut, forms the fourth side. In the court thus formed are niches and cells now long abandoned to bats and hyenas. The figures are of an antiquity apparently much greater than that of the wall. The nobly enthroned monarch is said to be of a truly royal mien, and though the storms of ages have beaten upon the stone, the countenances of king and courtiers are said to be still expressive, and may have been portraits of men who flourished long before "Timour the Tartar."

BOYS & GIRLS

Dorothy's Shakespearean Luncheon.

AGNES CARR SAGE.

Dorothy Appleton and Maizie Breeze were walking down Broadway. They were pretty, stylish maidens, both of them, in plain, close skirts and reefer jackets; looking taut and trim as well-built yachts, from the tops of their flower-crowned hats to the patent-leather tips of their neat kid boots.

It was a lovely day, at that delightful season when spring and summer meet, when the little squares are in full leafy green and New York shows at her very best.

But the brightness of the sunshine was not reflected in Dorothy's fair, young face and there was a decided note of discontent in her tone, as she exclaimed, "Oh Maizie, isn't it provoking? Papa has gone and asked a dreadful Western girl to make us a visit. She is to stay three whole months and go with us to the seashore; and I know I shall perfectly detest her."

"You poor thing!" responded Maizie sympathetically. Then, with a feeble attempt at consolation, "But perhaps she won't prove so bad after all."

"Oh, she will. I am sure she will! She will dress in some outlandish fashion, cut oysters with a knife, not know the use of finger-bowls and, perhaps, knock over decanters and *épergnes*, like the heroine in 'A Transplanted Rose.' I shall be mortified to death."

"But how did your father ever come to invite her?"

"Out of the kindness of his heart, I suppose. She is the daughter of a cousin of his and he stayed at their ranch when he went West on business. In some way this Peggy—for that is her horrid, plebeian name—completely captivated him. He says she is the most sensible, capable girl he ever saw, 'no nonsense or folderol about her' and he wishes I would take her for a model. Just fancy! the idea!" and Dorothy's piquant little nose went several degrees higher than nature intended it should.

Maizie could not resist a laugh. "Well, no doubt she will be a trial! A square Peg in a round hole, sure enough. But, maybe, you can keep her in the background until her corners are smoothed off a bit; and as her real name is probably Margaret, perhaps she will let you call her Daisy."

"Oh dear, I hope so! for I can never bring myself to introduce 'Peggy' Grey to the girls. Just think how Pussy Doolittle's lip would curl! But the worst of all is, I am so afraid she will arrive before the tenth when, you know I am to give an Author's Luncheon as a wind-up to our Shakespeare Club, and entertain that charming English girl who is stopping at the Windsor and whom I so hoped to induce to join us at Ocean Crest this summer. She will never come, though, if this dreadful 'Sweet P.' as papa has dubbed her, is to be there."

"No, I don't believe she will, for Gladys Beauchamp is a tremendous swell and awfully fastidious. You ought to have heard her snub Cora Rich the other day, when she was bragging about her mother's diamonds! It is hard lines, Dolly dear, but I will help you all I can and, meanwhile, don't let us borrow trouble but go and have a nice refreshing chocolate and vanilla." Saying which light-hearted Maizie led the way into Huyler's, where Dorothy soon mitigated her woes with ice-cream soda.

PEGGY SHOOTS THE MAD DOG.

Like most city girls of fifteen and sixteen, Dorothy and Maizie had their reading club, riding club, sewing class, dancing class, class in physical culture and a half dozen other fads to assist or hinder their school duties; while very enthusiastic were they about each in turn. Just at present a Shakespeare club held the uppermost place and Dorothy—who had rather a reputation for originality—was determined to surprise her friends with as novel and appropriate an entertainment as she could devise. In addition, then, to the liberal order given the caterer, she held frequent consultations with the florist and directed him to decorate the table with only such flowers as are mentioned by the great dramatist, insisting even upon wild thyme and rue; and, when Maizie caught her busily engaged with green tissue paper and wire she hustled them into a drawer and resisted all coaxings to reveal the mystery.

So the first days of June glided by and the little hostess was beginning to take heart of grace, when, on the evening of the ninth, a messenger in blue brought one of those écru missives which blast so many hopes. This was addressed to Mr. Appleton and read thus:

"My Peggy left on Saturday for the East and is due in New York at 9 A. M., on Wednesday, the tenth.
HOMER GREY."

"To-morrow morning!" cried Dorothy, aghast.

"To be sure!" replied her genial father heartily, "and that is first-rate, for she will be just in time for your fandango! But why do you look so doleful, daughter?"

"The table won't balance with fifteen."

"Ha, ha, ha! Won't balance, hey? Well, that would be a terrible catastrophe, truly! but you can invite someone else and make sixteen." Then, more sternly, "See here, Dolly! You have never seemed highly pleased at Peggy Grey's coming, but I can tell you she is worth a dozen of those giggling misses you are so fond of; and, in any case, I shall expect you to remember she is your guest and treat her as a lady should. Do you understand?"

"Yes, sir."

For when usually good-tempered, indulgent Mr. Appleton spoke in that tone his daughter dared not disobey.

Meekly enough, then, she went to meet the young stranger at the appointed hour and was the very "pink of courtesy," taking her hand-satchel, looking after her baggage and inquiring about her journey, all in a perfectly polite and well-bred manner. But poor little Peggy, accustomed as she was to open-handed and open-hearted Western hospitality, felt that it was altogether too polite, and longed ardently for a little more cordiality.

"An old-fashioned, looped overskirt, small, nippy sleeves and a hat at least three years old, while how dreadfully she rolls the letter r! I can never let her meet Gladys Beauchamp and the rest of our set to-day!" was Dorothy's mental comment, scarcely noting the beauty of the bonny, fresh face beneath the antique turban.

Consequently, when the little traveler had been welcomed by Mrs. Appleton and refreshed by a hot bath and breakfast, she ventured to say, "I have a luncheon-party to-day, Miss Grey, but, as you have only just arrived and must want to rest, I will not insist on your coming down, but will send your luncheon to your room."

"Oh, but I should enjoy it and would not put you to any extra trouble for the world. Indeed I am not a bit tired."

Dorothy groaned inwardly. "But your trunk has not been fetched from the depot yet."

Her voice and manner said more than her words and Peggy—who did not lack shrewdness—saw her countenance fall and comprehended that she was not wanted. The blood mounted to her cheeks but, with rare natural tact, she answered quietly, "True, and I reckon this traveling suit isn't very presentable. So, thank you, I believe I will stay upstairs and write home. They will all be so anxious to hear from me."

Dorothy breathed a sigh of relief, though her eyes dropped beneath her visitor's frank, searching gaze, while she had an uncomfortable sensation that this little prairie girl read her thoughts and was more truly ladylike than she had proven.

"This is the first time in my life I ever felt in the way, or not heartily welcome," thought Peggy angrily, when left alone. "Cousin Henry said his daughter Dorothy would be delighted to have me here but she doesn't act overjoyed and, oh dear, I hope she isn't always going to be so stiff and formal. But, there, it may only be New York manners and I won't imagine slights, but be as happy as ever I can, for there must be so much to see in this big city while I know there is one here who will open her beautiful eyes, in surprise and gladness at sight of me. I shall hunt her up to-morrow."

Bright and winsome as a primrose looked Dorothy in a soft, becoming gown of pale yellow *crêpon* as, with her good humor quite restored, she welcomed the gay bevy of maidens who fluttered in, one by one, full of merry chit-chat and the light, nonsensical laughter of early youth.

"I encountered a small trunk on the stairs and fancied the 'Sweet P' must have arrived," said Maizie Breeze tripping forward in a manner suggestive of her name. "Is it so, Dolly, and, if so, where is she?"

"Hush!" whispered the young hostess. "Yes, she has turned up, sure enough, like a bad penny; but I have maneuvered and kept her above, so don't say a word."

"And does she meet all your horrible expectations?"

"Oh, I don't know. She is not vulgar and does not murder the Queen's English; but Mrs. Noah might have sailed to Ararat in her traveling costume and she rolls her r's like all Westerners. But, see, there comes Gladys Beauchamp!" and Dorothy hastened to greet the special guest of the day.

"I hope I shall not cast a damper upon your pleasant party, Miss Appleton," said the English girl, in a low, well-modulated voice, "but Marion Ferris—for whom I called—has just been taken suddenly ill and was obliged to send a regret by me at the last moment. She begged I would apologize for her not informing you sooner but it was impossible."

"Oh, I am so sorry," cried Dorothy, adding, with a little gasp, "and oh girls, it will make thirteen at the table!"

"What matter! I, for one, do not mind and I trust you are all too sensible to care for a silly old woman's omen!" exclaimed Helen Maitland, the president of the club, who prided herself on being strong-minded, in its best sense.

The rest, however, were all silent and looked uncomfortable.

"It will spoil the whole affair," groaned Dorothy aside to Maizie, "and I wanted everything to be so perfect! What shall I do? Mamma has gone to spend the day with Aunt Annie and it is too late to invite anyone else!"

Little Miss Breeze considered a moment. "You might ask Miss Peggy to come down."

But at this suggestion, Dorothy flushed up to her wavy bang. "Oh, no; that would seem so dreadfully rude! To make a convenience of her after almost telling her to stay upstairs. Besides, I don't know how she would behave and I am so anxious that Gladys should have a good opinion of us American girls."

"Well, she looks now as though she would decline to sit at the table under the circumstances; while those foolish creatures in yonder corner are ready to cry. You had better make the best of a bad matter, dear, and go and throw yourself on your visitor's mercy. These uncultured girls are often good-natured."

"Oh dear, Maizie, I suppose I must, but I wish people wouldn't invent these ridiculous signs!" and feeling more embarrassed than she had ever felt in her self-possessed young life and with a very distasteful bit of humble-pie sticking in her throat, Dorothy mounted to the pleasant spare chamber where the little stranger was unpacking her small belongings, occasionally, in spite of her good resolution, dropping a few homesick tears upon the badly-made, dowdy little gowns which had been so carefully folded by loving hands, now many miles away.

"You see I am getting to rights," she said, dashing aside the pearly drops as Dorothy entered. "But how sweet you look! What a lovely dress!"

"Do you like it? Yes, it is pretty. But—but—I am in a dilemma and have come to ask a favor, Miss—Miss—."

"Peggy, please!" pleaded the girl.

"Well! Peggy then!" (with a gulp). "If—if you would be so kind as to change your mind and lunch with us, after all! One guest has disappointed which makes us just thirteen and, you know, how unlucky that number is considered."

The wraith of a smile curved the Western maiden's lips, as she observed her companion's anxiety and confusion and, for an instant, she contemplated a refusal. But only for an instant, for she was naturally generous and magnanimous, and there was but a brief hesitation before she replied, "Why, you are as superstitious as the Mexican miners! And you want me to make the fourteenth, and so put all at their ease?"

"Exactly. Will you? That is if you are not too fatigued."

"Fatigued!" and a merry, amused laugh rang through the room, "do you think me such a delicate creature as to be worn out by a trip in a comfortable Pullman car! I, who have spent whole days in the saddle and have hunted grizzlies!"

"Have you, really?"

"Yes, indeed; and shot one, too. So, of course, I will be glad to go down and be of service."

"Oh, thank you!" said Dorothy, gratefully, touched by the ready acquiescence. "And I hope you will like my friends and have a nice time. Sophie is busy downstairs, so I shall stay and help you dress. You would better wear that white frock on the bed."

Most speedily, then, the grey cashmere was discarded and the simple dotted mull donned; while Dorothy fetched a Toby frill of lace to tie about the slender neck and which was quaintly becoming to the bright-faced lassie.

"I have not much of a wardrobe," she explained, apologetically, "because mother thought Mrs. Appleton would select my summer things here and father told me to buy whatever I wished and send the bills to him."

"What! Gave you *carte blanche!*" cried Dorothy, opening her eyes. "Why, that is glorious, and is more than papa would do to me! He thinks I am fearfully extravagant."

"Dear pa knows he can trust his Peggy."

This was said with a gentle dignity that made Dolly wince, but she hastened to say: "Well then, we will soon have you as fine as the lilies of the field and oh! would you mind my calling you Daisy? It is so much prettier than Peggy."

"She is ashamed of me," thought the country lass, her heart sinking at the prospect of confronting a dozen counterparts of her hostess, and her brow clouded, as she shook her golden locks, saying; "I am not a bit of a daisy, unless it be the yellow kind we call 'nigger heads' out West and I love 'Peggy' because it is my home name and the name of the very dearest woman in the world besides. But I was christened Margaret and you may say that if you prefer."

"Very well! Margaret it shall be then," said Dorothy, thankful for even this compromise and beginning to feel more respect for her visitor. "But the girls will be wondering where I am and we must descend at once."

Meanwhile, Maizie had explained to the little company Dorothy's long absence from the room and told of the young cousin, just arrived from "a hundred miles beyond anywhere."

"A real prairie savage! Oh, what fun!" cried Pussy Doolittle.

"Some Western girls are delightful;" put in Gladys Beauchamp; "we met a number when we went to Yellowstone Park last summer and, one in particular I can never forget. She was the bravest, freshest, cleverest, little creature I have ever known. Indeed, she saved my life."

"Oh, how? Tell us about it!" chorused the others, gathering around the handsome young speaker.

"Well, papa owns shares in some mines in Colorado, and as he wished to see them for himself, we stopped for a short time at Silver Hole, a thriving little town which might be rather pretty, only it is so very flat, and so very new. My governess and I used to amuse ourselves by taking long walks in every direction to gather plants, and study the Western flora; and it was while returning from one of these expeditions one morning that I heard a tremendous shouting and confusion. Curious to know what the excitement was about, we hurried on, and had just turned a corner into the main street, when I saw, not fifty paces away, a huge Siberian bloodhound which was coming directly toward me, with red bloodshot eyes, and great flecks of green foam dropping from his jaws. At the same instant, the cry "Mad dog! mad dog!" shrieked by the pursuing crowd, fell on my ears, and seemed fairly to paralyze me. Miss March ran away screaming, but I was absolutely rooted to the spot with terror; everything swam before me, and I thought I was going to faint."

"Oh, I should have died!" exclaimed Maizie, turning pale.

"So probably should I—unless Pasteur could have saved me—had not a young girl suddenly dashed out of a shop, close by, and stood between me and the crazed animal. She was shorter than I, and, over her shoulder I saw, as through a mist, the dog half stop, crouch, and then make a spring toward her, while I covered my face with my hands, unable to bear the sight. Almost at the same moment, however, there came a loud, sharp report, a fiendish howl, and a cheer from the mob, and, when I did venture to look up, there was the brute stretched out dead on the sidewalk, and the girl standing beside him with a rifle in her hand. She had shot him straight through the heart."

"Ah-h, that was grand!" For girls always admire bravery, even if they are not very brave themselves.

"Was n't it? For think! If that gun had missed fire, the beast would have had his teeth in her throat, in another second. She never trembled either; only bent over the dog, murmuring: "What a pity to have to kill such a noble fellow!" while I was silly and hysterical, and had to be taken into a chemist's and given a soothing draught. There I discovered that this prairie Diana's father was the head of the mining company in which papa is interested, and that they lived on a great ranch ten miles from Silver Hole. After that we became warm friends, and I visited

a few days at her home, while it was wonderful how much that girl had read, and how much she could do. She kept house, as her mamma was something of an invalid, helped her father with his accounts; scampered over the plains on the wildest of little mustangs, and was in constant demand for picnics and parties by the young people of the neighborhood. Oh, when I return to England I shall always be eager to welcome all American girls, on account of dear—"

"Miss Margaret Grey, girls. Miss Beauchamp, Maizie, let me introduce my cousin from Colorado." But, before Dorothy could complete her presentation, there was a duet of astonished exclamations; a cry of—

"Peggy!"

"Gladys!"

And in another instant the high-bred English maiden and the impulsive little Westerner had thrown etiquette to the winds, and were hugging and kissing each other rapturously, while their hostess gazed on in mute bewilderment.

"When—where—did you ever meet before?" she finally found voice to gasp. At which the whole story of the mad dog had to be repeated—greatly to blushing Peggy's discomfiture—while the others (for girls are apt to follow a leader) made so much of Gladys's heroine that Dorothy suddenly discovered that she was entertaining a little "lion" unawares, and scarce knew whether to be pleased or not.

"The Peg seems to fit better than we feared," laughed Maizie in her ear, as they filed into the dining-room, while Helen Maitland declared, "I never saw anything more effective than that entrance; it was absolutely dramatic."

Only Cora Rich, who was jealous of Gladys, looked bored and contemptuous, and made sneering asides to a small pink and white damsel, who resembled a porcelain shepherdess, and who giggled incessantly.

When, then, outspoken Peggy, at sight of the dainty table with its gay shaded candles, flowers, and bonbons, exclaimed: "Oh, how perfectly lovely! I never saw anything like it before!" she turned to her and, with rude exaggeration of her pronunciation, drawled: "Now I reckon, Miss Grey, when you give a lunch in Silver-r Hole it means a perarie hen, a buffalo steak and Chinese paper-r napkins, doesn't it? At least, I believe that is what they gave my uncle at a dinner, in the "wild and wooly West."

Pussy Doolittle and the pink and white shepherdess snickered, and Gladys froze. But Peggy replied so quietly, and yet with so much spirit, "Really, Miss Rich? then I think your uncle must have dined with a Cherokee," that the tables were turned and Cora subsided, red and pouting into her seat.

"Oh, all luncheon parties are banquets, nowadays," cried sweet-tempered Maizie, eager to make a diversion, "but few, I am sure, have so pretty a *ménu!* See, isn't it appropriate, with the view of Stratford-on-Avon and the quotation, 'Sit down. At first and last, the hearty welcome!'"

"Very clever!" said Gladys. "And the flowers, too; for, look! here are 'Violets dim, but sweeter than the lids of Juno's eyes;' 'sweet musk roses and eglantine,' and many other favorites of the immortal William."

"Pansies, also, and 'rosemary for remembrance,'" quoth Peggy. "'And I pray you, love, remember!'" playfully breaking off a bit of the aromatic plant and handing it to her friend.

So, thanks to a ready wit and a good heart, the little thunder cloud which threatened the peace of the feast was dispersed, and one course followed another most merrily, while, if the young stranger felt at all puzzled by the variety of forks and numerous Frenchy dishes, she was quick enough to watch her companions, and thus avoid any mistake.

As for that little worldling, Dorothy! She was almost proud of her new cousin, when, with the lobster salad, the green mystery appeared also, in the form of a "literary salad," seasoned with a truly Shakespearean dressing, for, to each tissue paper leaf, was attached some lines from the master's plays, to be read aloud, and the quotation placed by the ambitious young students. For now, verily, the club was put to the blush by the outsiders, Peggy showing herself far more familiar with Julius Cæsar, Othello, and Macbeth, than any of the New Yorkers, except Helen Maitland, and being only excelled by Gladys, who, Maizie declared, "must have slept with Rolfe's Shakespeare under her head ever since she was born."

To the maiden from over the water, then, was awarded an exquisite little statuette of the fair, learned Portia, in cap and gown, inscribed with these words, from the "Taming of the Shrew",

"I will compound this strife!
'Tis deeds must win the prize,"

while the giddy-pated shepherdess, who never knew a quotation in her life, and only giggled at her own blunders, was consoled by a huge satin bag of sweets, on which was painted,

"This grief is crowned with consolation."

"Now, that last is what I call encouraging ignorance!" laughed Maizie, nibbling a salted almond.

"If it were not that 'She is not yet so old, but she may learn,'" quoted Peggy, who never bore malice.

"Hopeless, my dear, as 'She is bred so dull that she can't learn,'" paraphrased Pussy Doolittle, in a whisper; for even that difficult young lady had been won by the little Westerner's bright personality and Gladys's championship.

"Oyez! oyez! oyez!" cried President Helen, rising from her chair and tapping on the table with her coffee spoon. "Attention, ye Shakespearean scholars, all! I feel sure I but express the wishes of all the society when I tender to our hostess its sincere thanks and appreciation of this most successful and delightful valedictory to our pleasant readings, which we hope to continue in the autumn." Then, dropping her official tone, "It has been a success, hasn't it, girls, and we will have another, next year?"

"Yes, yes, yes," came from all sides, until blushing Dorothy felt constrained to rise and make a profound courtesy, though she declared, "I can't speechify, so don't ask me! But let us all go into the parlor and have some music."

"Too bad Marian Ferris is not here, with her banjo!" remarked Pussy.

"Yes, for she promised to sing us some of those funny darkey songs Gladys is so anxious to hear. I am dreadfully disappointed."

"Then am not I," said the English girl, "I would rather have my 'Prairie Flower' than negro melodies! But, Dorothy, did you know this young Lady Lochinvar, who comes out of the West, plays the guitar like a troubadour, and warbles like a skylark?"

"Why, Margaret! I am overwhelmed by your accomplishments! Where did you ever learn so much?"

"Much! Bless you, I am as ignorant as a prairie-dog about most things! Spanish José, one of our herdsmen, taught me the guitar, and I learned my letters out of father's big Shakespeare; while we have quite a goodish library of old-fashioned books, which I have always loved to read. Only, pray don't question me on modern literature, or modern music. I never heard of "Looking Backward" until to-day, and have never been to an opera, or a theater."

"Oh, how much you have to enjoy!" exclaimed Gladys, giving her a loving squeeze.

"And you must certainly let us hear you play and sing now," said Dorothy, delighted to have a novelty to offer her guests, for none of them played on the stringed instrument of romance just being revived by Dame Fashion.

With modest willingness, then, after Pussy Doolittle had sung "Marguerite," and Maizie Breeze executed a difficult "show piece" ón the piano, Peggy brought down the old guitar, inlaid with pearl, which had been her mother's, and she formed a quaint, attractive picture, in her white frock, the sunny curly hair pushed back from her face, and her small brown fingers deftly touching the frets, and running over the strings.

"Now be prepared for 'Annie Rooney,' or 'Down went McGinty,' sneered Cora Rich to the friend with whom she had been whispering ever since lunch.

But she was doomed to disappointment, while Dorothy could have danced for joy when the obliging young musician broke forth into a blithe little roundelay, and, to the low accompaniment, sang, in a perfectly-untrained, but thrillingly-sweet voice, that bespoke an undercurrent of rare power, Ariel's breezy, dainty song in the Tempest—

"Where the bee sucks, there suck I,
In a cowslip's bell I lie;
There I couch, when owls do cry!
On the bat's back I do fly,
After summer merrily.
Merrily, merrily, shall I live now,
Under the blossom that hangs on the bough!"

The air was as sprightly as the words, and was a master-stroke, coming, as it did, after the Shakespearean lunch. The girls were taken by storm and when Peggy followed it up, by performing a gay "Spanish Fandango," they clustered round her, begging for "just one more," until her short repetoire was completely exhausted.

"It was better than Marian's hackneyed 'Old Cabin Door,' and 'Roll Jordan, Roll,' was n't it, Dolly, dear?" exclaimed Maizie, as she kissed her friend good bye, "and this Western Peggy is a darling!"

"Yes, indeed!" responded Dorothy, heartily, "my luncheon would have been a fizzle without her, and I mean to call her by the name she loves best, and never be hateful and snobbish again," while it was the rose-leaf on her cup of happiness when Gladys Beauchamp said:

"You must let me share with you the pleasure of showing your jolly little cousin the sights of New York, and, since she is to be there, I shall certainly persuade papa to spend the month of August at Ocean Crest."

A Mouse Hunt.

ALICE E. PINNEY.

Such a hurrying, and scurrying, and scattering as there was among the corn stacks in the hill field, on the Morse farm, one day in harvest time. The poor frightened mice ran hither and thither, vainly seeking a hiding-place. Was a cat after them, you ask? No, only Freddie, Mabel, Dora, and three-year-old Donald. For once Don was in the background, for this was new sport for him, and he did not fully understand it yet.

The older children were hunting for mice to tame. They didn't mean to be cruel, but woe to the luckless mouse who fell into their clutches. Every year they had a regular menagerie of mice. If you have ever paid any attention to the mouse family, you have doubtless noticed the different species. There are the tiny field mice, with their fur like sealskin; cute little creatures they are, with their twinkling bead-like eyes. They are so cunning that it seems almost a pity to let old pussy-cat eat one after she has caught it. You feel a strong desire to rescue it and let it go free. Then there are the bob-tailed mice with ugly-shaped heads that you are glad to see exterminated; but the prettiest of all, is the harvest or deer mouse. Its fur is of a dark red and white. The name is derived from a habit the mice have of raising themselves upon their hind legs when they suspect danger, and leaping like a deer when they run. They are not so common as the others, and are only found at harvest time. The children considered a harvest mouse a rare prize.

To-day the mouse family had fair warning, for the children were bubbling over with laughter and fun; father said if there was a mouse within the range of a mile, they would scare him away.

Don didn't remember that he ever went mouse hunting before, and when the children talked of last year, he hardly understood what they meant. He could remember things that happened this year, but last year was entirely beyond him. He stood silently regarding the other children, his brimless straw hat in his hand, while the wind playfully tossed the golden curls that crowned his head, in a gentle caressing way, as if trying to smooth away the thoughts that were muddling his brain in such a perplexing manner.

He was suddenly aroused by the cry of, "A nest! a nest!" and a moment later, Freddie shouted. "There's one up my pants' leg." Mabel and Dora ran to his rescue, but at last, when it was shaken down, poor mousie had been pinched and pounded so, that he was dead as could be, and quite useless as a specimen for their menagerie, so he was laid aside to be taken home as a treat for the cat.

A whole nest of field mice were soon found, and Mabel and Dora acted as jailers, by gathering up the corners of their aprons and holding them tightly with their hands. Mabel was not at all afraid of the mice, and occasionally gave them a glimpse of freedom by taking one out in her hand and smoothing its soft fur. Dora, who was naturally more timid, putting on a semblance of bravery, cautiously took one of the little mice out in her hand. The mouse, seeing a chance to escape, fastened its sharp little teeth in her hand. Dora unclosed her fingers and he would have made his escape if Mabel had not been close by, but she gave him a smart little thump on the head which made it impossible for him to escape anywhere.

Fred, who came to see what the matter could be, said he would build a prison for the mice. So he

took a bright, golden pumpkin and, cutting a square piece from the top to serve the purpose of a trap door, also to allow him to clean out the seeds from the inside, and boring several holes to let in the air, he had a nice cage, or prison, made. At least it was one which, like other prisons, looked well on the outside, but which must have been very disagreeable within. Mice are not very sensitive to damp and cold, so doubtless they did not suffer as much as human beings would have done from such confinement.

The afternoon wore away. The sun which shone brightly when the children came into the field began to shed a chilly light over the cornfield, while the mountains in the distance were covered with the shifting shadows of the sunset hour before the children thought of going home. Their pumpkin cage was well filled with victims when they turned their steps homeward, with eager anticipations of supper and appetites sharpened by the crisp autumn air.

Don carried, lightly squeezed in his hand, the prize of the afternoon, so it seemed to him, as he trudged home proudly conscious of his triumph; for he had caught a wee baby mouse with his own hands. In vain the children tried to induce him to put it in with the other mice. He steadily refused to part with it even for so short a time. When he reached home, mamma was the first one to be treated to a sight of the baby mouse, though all the members of the family had a chance to admire, down to Joe, the "hired man" who was a confidential friend of Don's.

The little fellow bestowed so many caresses on his pet that at last it became very limp and cold. Joe proposed to Don that he let the old gray cat, who was stroking around his legs, take the mouse and warm it up. Don, who invariably took Joe's advice, immediately followed the suggestion, but an instant later, gave a howl of dismay as baby mouse disappeared down pussie's throat.

Joe, who had not expected his advice to be followed so promptly, took the poor, little sleepy boy in his arms and promised to find him a whole nest full to-morrow, and a few minutes later, the golden head rested quietly on Joe's arm, while Donald dreamed of his first mouse hunt.

Perhaps you would like to know what became of the mice that were in the pumpkin cage? Papa and mamma smiled when the children exhibited, with a great deal of pride, their unique contrivance for holding the mice; but they said not a word. The next morning when Fred, Mabel and Dora went out to see how the mouse family had rested in their new quarters, they discovered that every mouse had left for fields unknown. While they had dreamt of rows of pumpkin jails inhabited by mice, the little animals had been at work, and the pumpkin was completely riddled with holes that the mice had gnawed in order to get free.

The children decided then and there that while a pumpkin might answer for a temporary jail, it would never do for a prison.

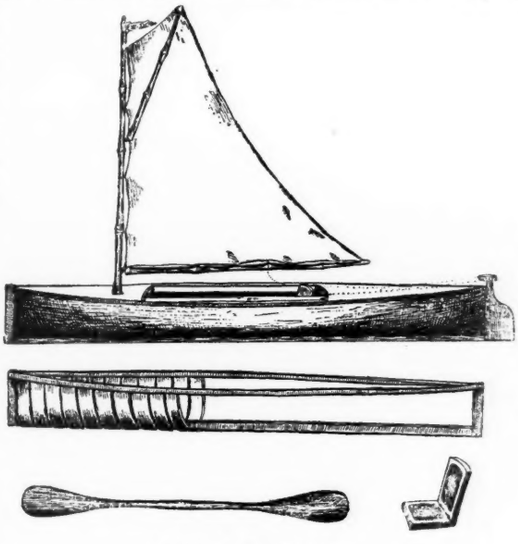
A Canvas Canoe.

WEBB DONNELL.

Some years ago when the writer was more of a boy than he would dare claim now to be, he owned and navigated a canvas canoe, which is still in his possession, in paddling and sailing which he found more genuine aquatic pleasure than he has ever experienced in any other kind of craft. The ease with which such a canoe can be rapidly paddled, and the swiftness with which a comparatively small sail, and even a light breeze, will cause it to race through, or rather over, the water, has a tendency to make the combined captain, crew and passenger list exceedingly well content with his surroundings. He can enjoy the fascination of rapid motion, and can explore nooks and corners of coast or rivers that would be inaccessible to ordinary boats. A canoe is an ideal craft for a camping-out trip, requiring very little hard work in motive power, affording plenty of room for the carrying of supplies, and capable of being turned into a dry and cozy bedroom at night, if one is overtaken by a storm.

Canoes can be covered with a number of materials, but the average builder who essays for the first time to fashion one, will undoubtedly have better success in using canvas than he would have with any other material. The "Kilmeny," which has given the writer many a pleasant outing, is thirteen feet in length, and two feet and eight or nine inches wide at the center. One end is a duplicate of the other, so far as form goes, the curve of the sides being the same from the middle to the bow, and to the stern post. The arrangement of the simple framework is shown very clearly in the illustration. The three lengthwise strips should be as light as possible consistent with strength. The "ribs" are simply broad, but very thin, strips bent by hand into the position shown, and secured to the lengthwise strips. These ribs should be placed at least within an inch of each other, and may be as wide as one can secure them, four or six inches being none too wide. These broad strips afford smoothness to the outside when the work is done, and protection to the canvas should the canoe chance to strike an obstruction. They need be but little more than an eighth of an inch in thickness. When all of these have been put in position, two thin and narrow lengthwise strips can be secured to them in the positions indicated by the dotted lines, thus giving stiffness and stability.

The crosspieces over which the deck is to be stretched should curve slightly upward, so that water will readily run off the top. The "well" in which the canoeist sits, should be framed into these crosspieces. After the canvas has been stretched over the deck, thin strips of wood should be fitted around the inside of this well, projecting a couple of inches above the deck. A seat made of two pieces of board, padded and hinged together, is fitted into the rear end of the well,



A CANOE AND ITS PARTS.

the back being held in place by hooks on eaen side that lock into screw eyes. The framework having been turned upside down, a thin, but firm piece of canvas is stretched over the bottom and sides, the stretching causing the covering to fit, since it is all in one piece. When it has been drawn as tightly as possible, and tacked around the top to the framework, it should be trimmed off even with the deck, and the deck cover stretched on, lapping over the edges of that already in place. Over these edges a thin strip of finish is secured on either side, as shown in the cut of the boat complete. Before the deck is put on, however, the inside of the canoe should receive a thorough painting with lead paint, as should also the outside when completed. If a sail is to be used, a keel two and a half inches deep is to be firmly secured to the bottom. A sharp cut-water is also to be added to the bow, and a mast and spars of bamboo prepared. These can be made from old fishing-poles. A sail of light duck is fitted to the mast in the manner shown in the cut. When the mast is removed, the sail and spars fold up around it, and are lashed with the small cord that holds the sail to the wind. The steering is done by the feet, cords passing from the rudder to a pivoted crosspiece where the feet would naturally rest. This leaves one's arms and hands free to manage the sail, or work the paddle. As the seat is so arranged that one sits in the bottom of the canoe, there is little danger of upsetting—none at all, unless one gets careless when "beating" against a heavy wind. To make a canoe perfectly unsinkable, two air-tight, V-shaped tanks of tin can be made at a tinsmith's, and fitted into the bow and stern, before the deck is put on. They should first, however, be painted with a double coat of white lead. The outside of such a canoe should be painted at least once each season, and when not in use it should be removed from the water, and covered from rains and the sun.

A rubber blanket is a most serviceable article when one is going upon an extended cruise. It should be large enough to entirely cover the "well," so that it can be used as a canopy during a shower, a light framework being carried for that purpose, or as a somewhat closer cover if one wishes to sleep in his canoe. In this case it must, however, be raised enough to give good ventilation. The double-bladed paddle, which should be as light as possible, will be found much easier to manipulate than the single variety. A dip first on one side, and then upon the other, is the easiest of all propelling motions.

A well-made canoe, light but strong, will afford more pleasure to the square inch than almost any other boyish possession, and in one's companionship with it, he will learn to delight more and more in this great and glorious world that lies out of doors.

Our Puzzle Contest.

For the best five lists of answers to the following puzzles we will give these prizes:

For the first best list a watch, worth $4.00.

For the second best list an AMERICAN AGRICULTURIST telescope, worth $3.00.

For the third best list a Florence plush toilet set, valued at $2.00.

For the fourth best list an AMERICAN AGRICULTURIST microscope, worth $1.00.

For the fifth best list an AMERICAN AGRICULTURIST jackknife, worth fifty cents.

These prizes will be forwarded, prepaid, to those who send the five *best* lists of answers. We do *not* offer prizes for every list sent in, but only for the five best lists, and, in awarding the prizes, the preparation of the lists is considered. If there are ties they are decided by the way in which the lists are prepared, the neatest list taking first prize. Answers must be mailed on or before the 20th of this month, to "Puzzle Editor," AMERICAN AGRICULTURIST, 52-54 Lafayette Place, New York.

14.—ANAGRAM.

A coat torn in rips. (The answer is one word).

15.—NUMEBICAL ENIGMA.

I am composed of 63 letters.
My 20, 49, 43, 28 is a musical instrument.
My 6, 1, 35, 13, 24 is a city in Massachusetts.
My 27, 57, 37, 51 is to calm.
My 14, 2, 47, 17, 23 is to press into a mass.
My 4, 60, 48 is a tree.
My 42, 16, 21, 58 is one who receives.
My 10, 25, 32, 11, 31, 45 is inferior.
My 15, 56, 22, 62, 44, 38 was a president of the United States.
My 33, 61, 55 is used as fodder.
My 54, 5, 52, 29 is to depend for support.
My 19, 8, 53, 36, 30 is to linger.
My 46, 39, 9, 63 is used in brewing.
My 61, 18, 3, 40, 12, 26 was one of the apostles.
My 7, 34, 50, 41, 59 is to originate.
My whole is found in one of the prophetical books of the Old Testament. Give the reference with the answer.

16.—SQUARE WORD.

1, a month; 2, to worship; 3, a wanderer; 4, belief; 5, droves.

ANSWERS TO THE MARCH PUZZLES.

7. 1, Leap—plea; 2, three—there; 3, lease—easel; 4, tales—stale; 5, mine—mien.
8. Plenipotentiary.
9. Nightingale.
10.

NORM
OLIO
RIAL
MOLY

11. "I'll put a girdle round about the earth in forty minutes."—Midsummer Nights' Dream, Act 2, Scene 1.
12. American Agriculturist.

THE PRIZE WINNERS FOR MARCH.

First Prize, Frank E. Bradley, Northville, Mich. Second Prize, Lockburn B. Scott, 37 Gloucester St., Ottawa, Ont., Can. Third Prize, M. H. Goodier, Cedar Lake, N. Y. Fourth Prize, Mrs. J. C. Harvey, Fort Fairfield, Me. Fifth Prize, Thoreau Cronyn, Bernardston, Mass.

Jamaica Fruits.

Oranges come next to bananas in value in Jamaica. They retail at 25 cents a hundred, and at $2.50 a barrel. This fruit is never cultivated in groves as it is in Florida, and receives no attention, trees being allowed to shift for themselves, even in the midst of a heavy meadow of guinea grass. Trees spring up everywhere from seeds scattered by birds, and, as soon as they begin bearing, the persons on whose lands they grow, gather the fruit, that being the extent of the care they receive. Limes and lemons are treated in the same manner, although limes command a good price in American markets, and large quantities of lime juice are exported to Canada and the British kingdom. Even pineapples are neglected in a way that would make Floridians ashamed of themselves. About 50,000 of these are exported annually, and as much more could be disposed of did the people raise the choice varieties and make them large and juicy by tillage and proper fertilizers. Were Americans to take hold of this industry, they could make it a decided success, judging from the efforts of some Floridians, who, with a climate liable to sudden outbursts of frost, cleared over a thousand dollars an acre on their pineapple patches last year. Many mango trees of several varieties grow wild all over the island and produce fruit equal to that of India or Siam. This magnificent fruit retails at six cents a dozen, and is eaten in large quantities by the negroes, who consider it one of the best known. Some of the largest trees I ever saw were at the hamlet of May Pen. It is nothing unusual for these giants to produce from eight to fifteen thousand mangoes a year, and as all cannot be eaten fresh, they are made into jellies and kindred delicacies. I prefer this to any fruit I know of, and, when ready to eat it, feel like following the East Indian advice of going into a bath tub while enjoying its fragrant and delicious juices.

J. M. MURPHY, Kingston, Jamaica.

Live Stock Husbandry in Victoria.

Our stock owners have succeeded in bringing all breeds of domestic animals to the highest perfection, and this is mainly due to the excellence of our pastures and the genial climate. In sheep breeding the greatest success has been achieved. Questions relating to live stock possess great interest for Victorians. There are now in Victoria four horses, 16 head of cattle, 124 sheep and three pigs to the square mile. Victoria was the first Australian colony to demonstrate to the world that Merino wool of exceptional fineness, length of staple, softness and lustre could be grown in large quantities in Australia. With the Heutys, our first colonists, came Merino sheep of the highest class. Mr. Heuty was a breeder of Merino sheep in the old country; to such an extent did he raise them that he was barred from taking prizes, his superiority being acknowledged. This flock came out with him and found their final home in the west of Victoria. In some of our flocks French sheep from Rambouillet, and American Merinos from Vermont have been introduced: but the finest sheep in Victoria are descended from Saxon merinos. It has been stated that in our climate lies the secret of the beauty of Victoria Merino wool. The Merino is sometimes bred by the farmer in the warmer districts, but where the rainfall is above the average, the Long Wool is the farmers' sheep. Of the Long Wools the Lincoln is preferred. Leicesters were grown for a time, but they are now merged in the Lincolns. Of the other breeds, only Cotswolds and Southdowns are bred in the colony. The great bulk of the sheep never receive any food save the natural pastures of the country, and in seasons of drouth, great sufferings are entailed on the flocks.

Among the first live stock imported into the colony were pure pedigreed, thoroughbred horses. The colonists of Victoria early developed a strong liking for racing and steeplechasing, and the performances of some of our horses could hardly be surpassed in any part of the world. Melbourne Cup Day is a public-holiday, and crowds of visitors attend the meeting from all parts of Australia. In the early days, a saddle horse was a necessity, they were unshod and grass fed. As a means of locomotion, we have now the American buggy, and buggy horses are plentiful. Victoria has a large trade with India, shipping over 3,000 horses yearly for cavalry, remounts and artillery horses. Victoria breeds successfully heavy draft horses, Clydesdales being in general use. Suffolk Punches and Lincolnshire horses were imported, but never came into favor. The muscular system of the Victorian bred Clydesdale is not so well developed as the parent animal, but his frame is large and his bone is good, and he has greater energy and quickness than the imported horse.

The cattle originally bred in the colony consisted mainly of Shorthorns, Herefords and Devons. Other breeds, such as the Angus, are now coming into favor. Very high class stock is held by breeders. The Victorian herds of stud Shorthorns have always been regarded as the best in Australia, and it is in these stud herds that the cattle breeders of the adjacent colonies seek the sires to improve the quality of their stock. Hitherto the cattle reared in Victoria have received no food but the natural pastures of the country. The milking breeds most fancied are Ayrshires and Alderneys. In the agricultural districts of Western Victoria, the farmers prefer the milking families of Shorthorns, for the reason that they are more readily fattened and bring a higher price when their career in the dairy is over. The most profitable branch of live stock farming over a large portion of Victoria is pig breeding. The Berkshires are the most in favor, though all the best English breeds have been introduced. Victoria is capable of not only supplying itself with the finest bacon, but of exporting large quantities. In 1889, there were in the colony 239,335 horses, 1,394,209 cattle, 10,882,231 sheep and 249,673 pigs, and the colony exported 135,607,370 pounds of wool, 16,779,840 pounds of tallow, and hides and skins to the value of £231,960.

D. E. MARTIN, Secretary for Agriculture,
Victoria, Australia.

Sheep in the Northwest.

The past three years have been of great prosperity for the golden hoof, especially in the new States of Dakota. Following the era of low prices, through 1885-7, North Dakota people commenced to buy sheep until prices quadrupled in value, and still sheep poured in, largely from Montana and Idaho, with pure-bred sheep from Vermont, Michigan, Canada, and across the water, until sheep husbandry became one of the institutions of Dakota. If the unparalleled drouth had kept up a little longer, sheep husbandry would have become second only to the growing of wheat. The unexpected and remarkable crop of some 65,000,000 bushels of wheat may check this growth for a term of years, but, for various reasons, the sheep hubandry has got to take front rank here. The climate is not objectionable, a steady cold through the winter only increasing the fiber if the sheep are properly fed and housed, for, in several lots shipped in from Eastern Michigan, the fleece has increased in weight fully 25 per cent.—a great increase. We have the short, nutritious grasses that sheep seem to thrive on so well. There are millions of acres from the James River valley westward that will never be fit for anything else but stock, and sheep seem to do wonderfully well there. Now, with these rich grasses in abundance, and good hay for the cutting, the sheep grower need not even pay the taxes on the land, but has an almost limitless range given him free. There are various spots where he can raise ruta-bagas by turning over the sod and sowing in the seed, for the soil seems to be perfectly adapted to raising all kinds of roots. Therefore, it seems as if the future great sheep country was in these coteaux of the Missouri. There are any number of small wolves or coyotes, but they are easily poisoned, and so rendered harmless.

Now, when hundreds are still looking and expecting to go into this industry, they are met by the cry of "free wool," and by an attempt to put wool on the free list. This must not be. Continue the present tariff for the next decade, and the Dakotas will prove the wonder of the age in sheep husbandry, producing great quantities of the very grades that are now so little grown in the United States, or so much grown in Australia as to be imported in enormous quantities. Thus we can distribute among Dakota farmers the money that is now sent to London for foreign wool. It is true that we can grow wool cheaper than they can in the older States, but we would have to, or there would be no inducement to open up this new country. But many farmers here have been doing exactly what they ought not to do, taking too large flocks of sheep, because it is so easy to care for them from the last of March until the first of December. The farmer thinks he will get through the four long, cold months of a Dakota winter somehow. In this county, which has over a million of acres, you find some farmers perfectly happy, with sheep fat and in good condition, while others may be losing any number from poor feed, poor shelter, poor care, and poor sheep to begin with. One farmer brought in 1,100 half-starved sheep from Wisconsin, landing here just as winter set in; the result is he has 200 left. Others have not lost a sheep for the past four years. J. C. WADE, Stutsman Co., N. Dak.

Agriculture in New Zealand.

Agricultural and pastoral matters in New Zealand continue in a fairly flourishing condition. Rains in the southern island of this colony, during harvest, have caused a good deal of the wheat to be damaged. In one instance out of 26 carloads of grain 12 had to be rejected, which shows that the proportion unfit for shipment is likely to be very large. Prices of live stock continue firm, and at good prices in the North Island. This is largely due to the very considerable areas that have been broken into grass, causing a strong demand for cattle and sheep stocking purposes. Land settlement is progressing, and the government is opening up tracts of country, and giving special facilities to small settlers. While prices of live stock hold good, there will probably be a large development in settlement, but another cause of this activity is, doubtless, due to the return to this colony of large numbers who had emigrated to Australia, and who are now being compelled to return by the depression that has there been prevalent.

The shipment of fruit by steamer to London is being systematically organized here by the New Zealand Loan and Mercantile Agency Co., which takes charge of shipments, relieves growers of all trouble, and guarantees freight charges. In Tasmania this work is done by a coöperative fruit-growers' association, which charges six cents per case for engaging freight and shipping the fruit. Members are to receive eight per cent. interest on their subscribed capital, subsequent profits to be divided *pro rata* among shippers. The season for shipping butter to England closed March 23d, and dairy farmers are at a loss to know what to do with the surplus, India and the Cape of Good Hope being suggested as available markets. Hop-picking is in full swing, the harvest being a month earlier than usual and the crop a fair one, notwithstanding the ravages of the red spider, which necessitated the picking of the hops before full maturity, in order to prevent complete loss. The price is good, and growers hope to net 25 cents per pound for their hops. The area planted to hops is about 600 acres. The total area planted to wheat, in 1891, was 301,460 acres, producing 5,723,610 bushels, a decrease in area of 34,401 acres, and in quantity of 2,724,896 bushels, as compared with the 1890 crop. WALTER F. LAWRY, Auckland, N. Z.

Farm Laborers Near Caracas.

Venezuela is now menaced with economic prostration and revolutionary uprisings. The tidings received from Washington that the refusal of President Andueza to negotiate a treaty of reciprocity with the United States has been followed by the reimposition of United States duties on coffee, sugar, and hides from Venezuela, and has produced a painful impression here. The value of the coffee exported from Venezuela to the United States in 1891 was $10,814,874. The value of the hides exported to the same market was $898,492. The duties which are imposed in consequence of the persistent refusal of Andueza to enter into a reciprocity compact will discriminate heavily against the most important staples of Venezuela. The coffee planters have perceived at once that the coffee of Brazil and Central America will have a marked advantage over that of Venezuela, and will crowd a product that is taxed out of the American market. The producing classes are thus confronted with the danger of losing all the ground which they have gained by the progress of agricultural industry during the era of peace which opened thirty years ago, when Guzman Blanco became a political dictator. The enforcement of

the Reciprocity clause of the Tariff law of the United States is one of the causes of the revolution which has suddenly broken out against the Andueza Government. His corrupt rule has closed the best market in the world against Venezuelan coffee.

Great as is the interest of coffee planters and other producers in securing the removal of the discriminating duties which have been imposed in consequence of the folly of President Andueza, the consumers have even more at stake. There is no other country in South America where supplies of imported food are subject to as high rates of taxation as in Venezuela. Everything which comes from the United States is liable to high tariff duties. During recent years flour has been taxed 110 per cent., and been carried beyond the reach of the mass of the population. Meats, provisions of all kinds, lard, petroleum, and all the other staples of American export, have been subject to as high duties as the Government had the hardihood to levy. The result has been that the mass of the population has been living on inferior food, and been deprived of many of the comforts which similar classes in other Southern countries enjoy. Reciprocity, if it could be brought about, would heavily reduce the price of flour and provisions, and relieve the people from burdens under which they are now staggering.

The lower classes of mixed blood live in huts, the framework of which is of bamboo sticks, with a coarse thatch of palm leaves or banana leaves at the top, the ends being open to wind and rain. Hammocks are, ordinarily, the only furniture, and so rare is a plain, wooden table that, when seen, it indicates progress in luxury. A short distance from the hut is the open-air kitchen, where a kettle is placed on three stones, over a fire of charcoal or underbrush. In this kettle a coarse potato or vegetable soup is made, and seasoned with onion and garlic. This is the commonest article of diet, with plantains, corn meal, and mandioca or cassava roots, ground by stone rollers into a paste. Nothing could be more foul or forlorn than these bamboo houses of the poor Venezuelan half-breeds.

AMERICAN VISITOR, Caracas, Venezuela.

[The accompanying illustration of a Venezuelan bamboo home has been engraved from a photograph sent by our correspondent.]

Negro Cocoanut-growers in the Bahamas.

The Bahama negro is the true cocoanut cultivator. His method is simple. There is no experiment about it. He plants as did his father and his grandfather before him, at all seasons of the year. When the inclination seizes the Island husbandman to increase his palm grove, he thoroughly soaks a nut in water, and lays it in a shady spot, covering it thickly with wet sea kelp. At the end of a fortnight—or three weeks at the longest—it has sprouted. Then he plants it a foot under ground, sprinkling it over with salt—a superstition of his race—to insure a thrifty growth. He covers it lightly, and hastens the growth by occasionally working the soil above.

At the end of a month, the pale green sprout has shot up a foot or more, when it is dyked around, leaving it in an earthen basin, which is kept filled with water. A rank grower, the seedling palm speedily mounts toward the heavens, and requires no further attention from the ease-loving planter than plenty of water and an occasional grubbing about the roots. In five or seven years, it comes to maturity, and bears fruit, when a mass of the abundant refuse sponge of the country is piled about the base of the trunk, to keep the roots cool and enrich the soil. Extraordinarily prolific, the cocoanut palm bears fruit the year round. On a healthy, well-nourished tree, a half dozen stages of growth may be seen at one and the same time, the delicate blossoms swinging their pale straw-colored plumes above the ripened fruit. The young trees of medium size are preferable to those older and heavier in trunk. They bear more abundantly, and the fruit is larger. Those of superior growth bear comparatively little. Their symmetrical beauty, however, preserves them from destruction, for no more striking object is seen on the vivid tropical horizon, than the silhouette of these barren majestic trees.

GORHAM SILVER, Nassau.

The Climate of Alaska.

Though this is popularly supposed to be a frozen region, South-East Alaska is 55°7 N. latitude, and has the mean temperature of Norfolk, Virginia. During the entire winter we have had less than 30 days in which the temperature was below the freezing point. As I only began observations on November 1st last, I cannot give an official summer record, but the temperature is said not to exceed about 70°, making the total annual range only about 50°, and the greatest daily range has but once reached 16°, and is very seldom above 10°.

All garden plants that enjoy cool, moist weather flourish. Potatoes, turnips, cabbages, celery, strawberries, raspberries, gooseberries, rhubarb, onions, beets, lettuce, etc., did well last year. We have no land, yet, suitable for farming, but wheat and oats will ripen. This is a paradise for pansies, which are here the most luxurious bloomers I have ever seen. Our summers are delightful, but from October to April we have almost constant rains.

JAMES F. MCKEE, South-East Alaska.

A BAMBOO HOME IN VENEZUELA.

Long May It Live!—The AMERICAN AGRICULTURIST comes to us like the face of a familiar friend. We have held on to it, and have derived much pleasure and profit from it. It grows better and better as the years fly by. Long may it live!

MRS. C. A. BRADRICK, Franklin Co., Ohio.

FARMING IN FOREIGN LANDS.

Fresh outbreaks of swine fever have occurred in Scotland.

Olive trees are being grown in South Africa, in conjunction with vineyards.

Continued drouth has caused great anxiety throughout the island of Cyprus.

The soil of Hayti is very fertile. Corn is easily grown, and three crops can be raised annually.

The manufacture of starch from potatoes is attracting attention in the Australian colonies.

The yield of wheat in the Argentine, this season, is unsatisfactory, in some districts hardly paying threshing expenses.

The National Agricultural Society of Hungary has arranged a trial for reapers and binders, to be held on July 9th and 10th.

Cotton is one of the most important products of Persia, the annual crop amounting to about 35,000 bales, mostly Ispahan cotton.

In the Bahamas there are now planted 4,200 acres with 2,633,000 sisal plants. The fiber is worth $100 to $150 per ton, cleaned.

Germany, Holland, and Scandinavia have imported such large stocks of maize that their importations of wheat are declining.

Sheep in Cape Colony are looking poor and sickly, especially September lambs, which are infested with parasites internally.

The French Minister of Agriculture has drawn public attention to frauds in manure, especially with regard to the coloring of phosphates.

In New South Wales the dairy season has been a good one, produce plentiful, and prices of both milk and butter high, owing to export trade.

German sugar journals are suggesting restriction in the cultivation of sugar beets, so as to maintain the price of sugar at a paying rate.

Hops grown in Poland are exported to Germany, where they undergo a process of sulphuring, and are shipped back again for local consumption.

Poultry has just passed through a disastrous season, especially for young stock, in Australia, the chief trouble being diphtheric roup.

Shipments of lemons, grown at Trinidad, made to St. John's, N. B., gave a return of $400 per acre, the trees being planted 15 feet apart, and 90 to the acre.

The exports of wool from British India will be as heavy as two years ago—about 24,000,000 pounds, compared with 21,345,000 pounds for the 1890-91 season.

Foot and mouth disease has appeared in Holland, and the importation of live stock into England is now prohibited from all European countries.

The first crop of tobacco, 510 bales, grown in North Borneo, was shipped, in January, to Europe. The grade is well spoken of, and it reaches an early market.

The soil and climate of Manitoba, Canada, are largely adapted to the growth of roots and vegetables. Potatoes yield profusely, and also turnips, beets, and mangels.

A three-year-old Shorthorn cow, owned by J. Rose, of Brunswick, Victoria, has given birth to four calves, one bull and three heifers, all strong and well proportioned.

In Palestine early rains should fall in October and November, or crops are likely to be small. If the late rains do not fall in the early part of April, the crops will not mature at all.

In connection with the Australian conference on rust in wheat, a series of questions has been propounded and sent to growers, whereby valuable discussions and results are expected.

Cotton culture has been introduced into several districts in Russia, and so succesfully in the Cossack country, on the river Don, that the industry will be thoroughly established there.

Elevated lands in Bolivia are productive, and the valleys and lowlands extremely fertile. Barley, wheat, and corn are grown, but not to any large extent, owing to crude agricultural methods.

Germany has spent upward of $650,000 in fighting the phylloxera, which did not cause as much destruction as in France, and so far has been kept out of the fine vineyards of the Rhine.

The French Minister of Agriculture has taken steps to study means for increasing the sheep production of Algeria, for improving the breeds, and for organizing a practical and inexpensive export system.

A botanical station at St. Vincent, West Indies, is conducting experiments tending toward progressive agriculture by importing roots and cuttings. Most of the manual labor is performed by prisoners.

In British Honduras maize is the only cereal cultivated to any extent, and occupies 70,000 acres of land. It forms the staple food of the Spanish population and the Indians. The average yield is 56 bushels per acre.

Madagascar is beginning to draw to the front as a productive agricultural colony. Geographically she is better situated to Europe than is Australia, and climatically she is superior to the northern part of that continent.

Horses in the German artillery and cavalry regiments are now shod with paper. The shoes are made by cementing forms of parchment paper together and hardening them by hydraulic pressure, then rasping to fit the hoof.

In France there are two classes of the olive, the wild olive, producing only a few small berries, and the cultivated olive. The tree flowers every year but the majority of olive growers are content to get a good crop every second year.

In all the Australasian colonies, in 1891, the total number of live stock was: Horses, 1,695,000; cattle, 10,799,000; sheep, 114,079,000; pigs, 1,261,000. The total wool production was 505,712,887 pounds, an average of 4.43 pounds to each sheep.

Mechanical cotton-pickers and cleaners are needed in India, owing to the complaints made in England as to the adulteration of India-grown cotton. Conveniences for storing and cleaning grain and for husking rice are also required.

Sugar cane at Trinidad is attacked by a small, boring beetle, that enters the cane at the knot, making long channels, in which the eggs are deposited. This insect differs in size and other characteristics from the ordinary cane borer.

A Belgian invention is a patent whereby two blocks of cork can be securely clamped into an ordinary horseshoe. It is claimed that the cork will last as long as the shoe, that it prevents slipping, and makes traveling light and easy to the horse.

The agricultural section of Chili contains 43,418,000 acres, the soil being extremely fertile. Wheat yields are enormous, corn and barley do well, as also rye and oats; but the two latter are not very largely grown. At one time Chili exported grain to California.

Shippers of Tasmanian apples to England use boxes that are two feet three inches long, six and one-half inches broad, and fourteen inches deep, with a division across the center. These cases hold nine dozen extra large apples, or fourteen dozen of medium size.

The New South Wales Department of Agriculture is organizing a monthly-crop-report system, which will include colonial and foreign statistics as they affect local commercial farming. The system will be modeled upon that of the United States Department of Agriculture.

Tobacco has been cultivated, with more or less success, in Southern Queensland for many years, the duty on imported leaf being 35 cents, and upon manufactured tobacco 75 cents per pound, while the local article pays no duty. There are 10 cigar factories in the colony.

North Australia has been saturated with rain, and the region on the border of South Australia and New South Wales has been parched. Near Broken Hill the population of 30,000 was dependent upon water supplies brought by train from Adelaide, a distance of several hundred miles.

In Scotland sugar beets have been grown analyzing from 12 to 13.6 per cent. of sugar, with crops from 12 to 15 tons of beets per acre. The sugar refined in Greenock alone is equal to the product of 200,000 acres of beets, and efforts are being made to have the raw material of home growth.

Owing to the failure of the Dutch potato crop last year, considerable quantities of potatoes have been shipped from the northeast of Scotland to Rotterdam, and exports for the season are expected to reach 1,000 tons. A larger area than usual has been planted to potatoes in Scotland.

The agricultural district of Ecuador is in the interior, and mainly cut up into small farms, chiefly occupied by Indians. Wheat, barley, rye, corn and potatoes are main products, the area devoted to wheat being 35,000 to 40,000 acres. Cultivation is primitive.

The quantity of cheese exported from Canada in 1891 was 106,202,000 pounds, of the value of $9,508,800, as compared with 24,000,000 pounds, valued at $3,253,000 in 1874, and 69,755,423 pounds, value $7,251,989, in 1884. This rapid development in the manufacture of cheese naturally limited the output of butter.

The wheat exports of India in 1891 were 46,600,000 bushels, as against 22,404,116 bushels in 1890. The 1891 exports were the largest ever known, the next highest being 37,758,133 bushels in 1886. The crop of 1892 is promising better than was formerly reported, owing to good rainfalls coming late in the season.

In Melbourne the potato market has been seriously depressed. One shipper received four dollars as net returns for 13 tons of potatoes, while consignments of others were utterly unsalable, and producers had to pay freight and all expenses, as well as the cost of having the potatoes carted away and buried.

The wine industry in Southern Brazil is improving, though the quality of the wine is still sharp. The government fosters that industry by granting free transportation for vine products, for two years, over State railroads; also by providing for a grape culture and phylloxera station, and for the diffusion of viticultural knowledge.

In Russia there are 750,000 acres planted to sunflowers. One variety has small seeds for the production of oil; the other has larger seeds, and is used for consumption, like our peanuts. The average yield is 1,350 pounds per acre, and the seeds sell at one and one-half cents per pound, the farmer's income being $20 per acre.

The total area cultivated in England, in 1891, was 48,179,473 acres, as against 48,045,755 acres in 1890. The cereal crops in 1891 covered 9,443,509 acres, as against 9,574,349 acres in 1890; green crops, 4,510,653 acres in 1891, and 4,534,145 acres last year; hops, 56,145 acres, against 54,555 acres; small fruits, 60,138 acres, compared with 46,733 acres in 1890.

Europe has 12 million beehives, and produces 307,000,000 pounds of honey, while the United States has 2,500,000 hives, and produces 61,080,000 pounds of honey. The largest apiarist in the world is M. Harbicon, of California, who has 6,000 hives, yielding 200,000 pounds of honey yearly. It is estimated that a bee must visit 218,750 flowers for each ounce of honey gathered.

There are over one million square feet of glass surface in Great Britain exclusively devoted to the cultivation of tomatoes for market. In the height of the season they sell for eight to sixteen, and sometimes up to fifty cents per pound. In Guernsey and Jersey the tomato can be grown in the open air, and these islands supply London with over 1,000 tons annually, valued at $250,000.

The number of holdings in New Zealand, over one acre in extent, was 38,083 in 1891, as compared with 38,178 in 1890. The extent of land broken up but not under crop was 210,509, compared with 149,979 acres. Under crop there were 1,354,768 against 1,340,398 acres in 1890. The quantity of old wheat on hand in June last was only 74,000 bushels, against 502,000 bushels on hand at the same date in 1890.

In the New South Wales parliament a bill has been introduced to provide means whereby pastoralists and agriculturists can form themselves into local boards, with power to make an assessment on their stock for establishing a fund to utilize the surplus sheep and cattle. There are millions of sheep, but no market. Freezing works are to be erected at all railway centers, and surplus meat, that cannot be consumed in local markets, is to be shipped to England. In South Australia sheep are dying by thousands, owing to drouth.

The last census of Cape Colony gives the following returns of live stock on April 5, 1891: Bulls, 50,639; milch cows, 581,978; oxen, 610,866; other cattle, 967,351; stud stallions, 7,396; brood mares, 94,659; horses and mares, 342,092; mules, 50,961; asses, 45,384; wooled sheep, 13,631,011, and other kinds, 3,075,095; angora goats, 3,184,018, and others 3,444,019; pigs, 288,190; ostriches, 154,880; dogs, 302,804; fowls and ducks, 2,452,312; geese, 145,630; turkeys, 67,913; rabbits, 2,050. The number of cattle that had died during the previous year was 75,377 from lung sickness, and 96,883 from red water.

SCIENCE IN FARMING.

CORN SILAGE VS. SUGAR BEETS.—The relative fattening values of fermented corn fodder and of sliced sugar beets has been ascertained at the Michigan station (B. 84), by P. M. Harwood and F. B. Mumford. Eight grade Shropshire lambs used daily one pound clover hay, 0.7 pound oats, 0.3 pound bran, and 4.7 pounds sliced sugar beets. Eight other lambs of the same breed consumed each day the same amount of grain, but 0.8 pound clover hay, and 4.4 corn silage. The beet-fed lambs averaged 36 pounds gain to each, and the silage fed 30 pounds each, in 12 weeks. The cost of 100 pounds gain with beets was $4.38; of 100 pounds gain with corn silage, $4.96. The average gain of each lamb on sugar beets was three pounds per week. Each lamb on silage gained 2.5 pounds per week. The nutritive value of the beet ration was 1:6; of the silage ration 1:7. The experiment indicates that, by using either sugar beets or corn silage, lambs may be profitably fattened on a light grain ration, and that for this purpose sugar beets are preferable to corn silage.

EXERCISE AND SHELTER FOR STOCK.—If free to choose between barn and field, stock will seek shelter only during storms. Experiments by J. W. Sanborn, in the dry, cold climate of northern Utah (B. 11) seem to prove that this natural inclination is also the most profitable to the farmer. The cattle ate more when in the open air than when stabled, and much of the extra food was coarse material refused in the stable. The open-air cattle gained the most weight in the same time. Four years of experiment has shown that in a dry climate stabled cattle use more feed for a pound of growth than those not stabled. Cattle kept in yards surrounded by high windbreaks did better than those kept in the open field, and better than those stabled. Steers turned out every day, and others kept loose in box-stalls, did better than those tied in stables, proving that cattle need exercise. Work horses, blanketed in the stable at night, and wearing blankets beneath their harness during the day, did not hold their weight as well as those without blankets. No trials were made with stable horses blanketed only while being worked on stormy days. None of the trial cattle were allowed a choice of shelter. No comparison was made between horned and hornless or dehorned cattle. Sheds were not tried. No experiments were made with cattle given the choice of the open field, the sheltered yard, the open shed, and the closed stable. Nevertheless, the experiments prove that exercise in pure air and sunlight is necessary to supply the healthy appetite which eats and thoroughly digests the most possible food in the shortest time.

TESTING MILK.—Some of the creameries of Vermont analyze their milk as it is delivered, and pay for it according to its value. W. M. Cooke (N. B. 4) states that, to determine the quality of milk, a milk tester is needed to measure the fat, and a lactometer to find the specific gravity. The method of analysis is as follows: The per cent. of fat is found with the milk tester. The milk is then warmed or cooled to exactly 60° F., and the reading of the lactometer taken. One-fourth the reading of the lactometer added to one-and-a-fifth times the fat gives the total solids. Subtracting the fat from the total solids leaves the solids not fat. Although whole milk may vary in fat from two to eight per cent., the Vermont law considers all milk illegal that contains less than 3.25 per cent. fat. The lactometer readings and the solids not fat are quite constant in whole milk. The lactometer readings of the whole milk of herds are seldom above 33 and never below 29. The solids not fat in the whole milk of herds is usually from 8.75 to 9.25, seldom goes below 8.40, and never below 8.10. Skimming leaves the solids not fat higher and the lactometer reads higher. Watering the milk lowers the lactometer reading. These tests are necessary when milk is not paid for according to its real value, but is bought by mere weight or measure.

COPPER AND ARSENIC ON SPRAYED FRUIT.—Ten pounds of grapes grown by the Massachusetts Agricultural College (H. B. 17), sprayed throughout last summer with lime sulphate of copper (Bordeaux) mixture, and badly disfigured, analyzed only .002 per cent. of oxide of copper. One-half to one ton of such grapes would need to be eaten, with their stems and skins, to obtain sufficient copper for the least injurious effect. Ten other pounds of grapes, grown on adjacent vines, but treated with lime sulphate of copper before June 15th, and with ammonia carbonate of copper thereafter, and not in the least disfigured, contained not a trace of copper. Apple trees were sprayed three times with lime sulphate of copper and Paris green. The latter contains arsenic. Twenty of these apples, measuring one peck, contained not even a trace of arsenic, and only .0014 grams of copper oxide. Thus, all the arsenic, and practically all the copper, had been removed by the wind and rain. From the horticultural experiments, S. T. Maynard concludes that apple scab, pear-leaf blight and cracking of the fruit, the peach and plum fruit rot, the plum-leaf blight, the plum black wart, the grape powdery mildew and black rot, the raspberry anthracnose, and the potato-leaf blight and rot, may be wholly or largely prevented, with safety, by spraying with solutions of sulphate and carbonate of copper. Also, by using the arsenites and acetates of copper (Paris green), not only are the above fungi destroyed, but the tent caterpillars and canker worms are killed, and the damage to the apple and pear from the codlin moth, and to the plum and peach from the plum curculio, may be greatly lessened. The copper solutions do not stop the growth of the spores of the plum wart in the tree, but painting with kerosene paste destroys them. The peach leaves were found so easily injured by copper solutions that it is recommended to spray them at one-third to one-fourth the strength used upon the apple and pear. On account of the arsenic, Paris green should not be used on strawberry plants until all the fruit has been gathered.

CULTIVATION OF CORN.—The roots of American corn and other grass plants do not grow deep into the soil, but spread near the surface. Experiments through four years, at the Indiana station, by W. C. Latta (B. 39), favor shallow cultivation of the growing corn. There was an average yield of 58.7 bushels on ground cultivated one inch deep, 53.5 bushels when two inches deep, and 50.8 bushels when three inches deep. A spring-tooth cultivator was used, and the dark clay soil was plowed eight inches deep. The subsoil is a coarse gravel. Three years' trial of early and late planting in May show best yields for the earlier planting. Through six summers of thick and thin planting the best results are given by stalks 12 to 14 inches apart, in rows three feet eight inches from each other. A rotation of grain and grass gave better returns than constant grain-growing, but the rotation should be supplemented with fertilizers to insure continued good yields. Stable manure was more lasting and gave better yields of corn than commercial fertilizers. Shallow-running corn cultivators, which thoroughly pulverize the soil and leave the surface nearly level, gave the best satisfaction.

SUGAR-CANE CULTURE.—The greater part of the cane sugar produced in the United States is grown near the mouth of the Mississippi river. During the last six years W. C. Stubbs has conducted experiments with sugar cane at the Louisiana station (B. 14). A warm, dry winter, succeeded by a rather dry spring, and the latter followed by a hot, wet summer, are conditions favorable to the greatest growth of cane. A dry, cool fall, beginning early in September is necessary to a high sugar content. The mean temperature in summer was 82.3° F., in fall 70.4°. During the summer 21.5 inches of rain fell, and during the fall 10.2 inches. The yearly temperature is 69.4° with 58.5 inches of rain. The cultivation of the cane is stopped late in June, and frequent heavy showers in July are needed for the greatest tonnage. The stripping of dead leaves from the growing cane did not prove beneficial. During the dry summer of 1891, irrigation was tried with profitable results, there being a great increase in both tonnage and sugar content. It was found that sugar cane would stand a complete flooding for two days, with the air at an average temperature of 72° F., and reaching as high as 90°. The land was well drained, however. The trials show that a thin stand of plant cane, if cultivated well on rich ground, gives good stubble. Narrow rows, just wide enough to cultivate, proved best. No fertilizers could be found which increased the sugar content. Sulphate of ammonia was found the best, and cotton-seed meal the most profitable, nitrogenous fertilizer for tonnage. In the time required for extraction, and in the amount of sugar obtained, the striped cane was markedly superior to the purple. Chemical analyses showed that the composition of the cane varies greatly during growth. The percentages of ash, albuminoids, and fat are greatest in the young cane, decreasing as it grows older. There is but little fiber and sugar in the young cane, but these increase toward maturity. Most of the sugar is formed while the cane is ripening.

CATTLE FOODS AND CONDITION POWDERS.—By advertising, rather than actual results of feeding, many prepared cattle foods and condition powders are being sold. Chemical analyses at the New Hampshire station by F. W. Morse (B. 15) show that these need as much inspection as fertilizers. A Philadelphia food, sold at $6 per cwt., had the same composition as wheat middlings, with some fenugreek and common salt added. A New York condition powder sold at $16 per cwt., had the analysis of corn meal, mixed with cotton-seed meal and flavored with common salt and fenugreek. A Vermont concentrated food, sold at $8 per cwt., was not as rich by half in protein and fat as cotton-seed meal, but was flavored with common salt and fenugreek. Farmers would do better to buy corn, bran, cotton seed and gluten meals at one-sixth the price, and, if needed, add such medicines as sulphur, salts and fenugreek, which cost a few cents.

CHINCH BUGS.—In dry seasons the grain crops of the Mississippi Valley are greatly injured by chinch bugs. As these insects suck the sap from all grasslike plants, their food is richer in dry weather and the plant less able to withstand the loss. At the same time the chinch bugs increase very fast, while in wet weather they decrease from fungus and other diseases. S. A. Forbes, State Entomologist, reports to the Illinois station, (B. 19) that the drouth of last year caused an unusual development of chinch bugs and, should this summer prove dry, serious loss can hardly fail to ensue. He advocates, as practical measures of defence, the burning of the bugs when in their winter quarters in rubbish; the diminution of their food supply by not growing spring wheat, barley, rye, Hungarian, and millet; the support of the infested crop against the loss of sap by quickly-acting soluble fertilizers, especially those containing nitrogen and phosphorus; the spraying of infested spots with kerosene emulsion or covering them with straw, and burning; arresting the movement of the bugs from field to field by plowing a deep furrow in which the bugs accumulate and are then killed with kerosene emulsion. Fresh cornstalks laid in the furrow will tend to keep the bugs there. The emulsion can be made by mixing two parts kerosene with one part strong, hot soapsuds, and agitating until a permanent cream or soap is obtained. Dilute with 10 to 12 parts water, and apply with a sprinkler or spraying pump. Bugs collecting on the outer rows of corn may be successfully killed with this emulsion. The use of contagious insect diseases is still in the experimental stage; the relations of this method to various weather conditions being, as yet, particularly doubtful. Its promise is such, however, as to make it well worth while for any one interested to try the experiment thoroughly and carefully. Isolated and individual measures, though often resulting in great good, are of but little value compared with a general coöperative attack undertaken by all the farmers of a threatened neigborhood.

FERTILIZERS FOR TOMATOES.—As the tomato combines the good qualities of a fruit and a vegetable, its consumption is large and is rapidly increasing. The warm soils of the Southern States bring this crop to perfection. G. Speth, at the Georgia station (B. 17) has tested the effect on tomatoes of single fertilizing materials, of combinations, and of successive applications of these. The soil was a hard clay, with a clay subsoil. The fertilizers were cultivated into the ground. The application of nitrogen or potash alone did not increase the yield on poor land. The effect of the nitrogen depended on the presence of phosphoric acid and potash. Only the complete fertilizers gave profitable returns. The yield increased with the amount of complete fertilizer used. The nitrate of soda did best in two applications, the cotton-seed meal in one. Nitrogenous fertilizers were most profitable. Phosphoric acid, in double ration, not only decidedly increased the yield, but also furnished the earliest fruit. Large rations of nitrogen, especially in the form of cotton-seed meal, prolonged the time of bearing. These fertilizers were profitably applied in June, when cultivating.

Alfalfa.—J. Gogarn, Alger Co., Mich.: Alfalfa does well on any deep-plowed land. Twenty to thirty pounds of seed are sown to the acre. It does best drilled in early in the spring. Many farmers prefer to plant alfalfa with oats, gaining the oat crop and the protection of the stubble the first winter. Alfalfa is of slow growth, and should not be cut until the second year. To the north there is danger of winter-killing unless the plant is ripened on dry land in the fall, and a good growth is left standing to hold the snow. For this reason it should not be mowed or pastured late in the fall. Alfalfa withstands drouth better than red clover, and makes as good hay, but poorer pasture.

Renovating Lawns.—J. Bonita, Alameda Co., Cal.: To renew the grass on your lawn, where it has died out in spots, scratch the surface with a sharp steel rake, then scatter fresh seed, and either rake it in, or sift fine, rich soil over it. In your dry climate, it will be necessary to apply water in sufficient quantities to insure the sprouting of the seed, and afterwards enough to keep the young plants growing. Always apply the water in the evening, as it will settle down into the soil during the night, and little be lost by evaporation. Bone dust is an excellent fertilizer for lawns, and may be applied in considerable quantities, if you irrigate freely.

America versus Australia.—G. H. Glasscock, Pandwich, Australia: We cannot advise you in regard to the advisability of leaving Australia for the purpose of coming to the United States and settling on government land, and becoming a farmer. We are inclined to believe that the opportunities of the farmers of Australia are fully as good for making a living as those of this country, but if you think differently, come and try it. You will, however, find that the best lands have already been taken up, and are under cultivation, but there are always plenty of farms for sale, and they can often be purchased for less than the improvements have cost; in fact, as a rule, it is cheaper to buy improvements than make them. Wild or government land can be obtained by purchase for $1.25 per acre, or under the Homestead Law by a five years' residence upon it and a payment of $18,000 for 160 acres. There are some tracts of land that cost just double the above, the difference depending upon the location, but all are wild, and some not worth accepting as a gift.

Nitrate of Soda in the Greenhouse.—R. G. H., Norwalk, Conn., writes us: "I wish to know if nitrate of soda is ever used by florists on roses, carnations and violets under glass, and if so how should it be applied?" As a rule florists use a soil or compost rich enough. More plant-food than the sun will enable the plants to organize can do little good. If the soil is not rich enough a little superphosphate of lime and nitrate of soda can be used with very great advantage. An ounce of nitrate and an ounce of superphosphate to a gallon of water can be used with perfect safety. A florist reports that he used nitrate on violets and it produced flowers with such long stems that the dealers in the city thought he had a new variety.

When to Prune.—W. H. Wright, Woodford Co., Ill.: The best season for pruning red cedars and other evergreens is early spring before growth commences, but it will do no great harm to prune a little later, although late pruning of such trees will, in a measure, check their growth. Prune early to encourage a vigorous growth of wood, and late to check it, is a good rule to follow with all kinds of trees. The best treatment for old and neglected raspberry and blackberry plantations is to take up enough vigorous suckers to set out a new one, then plow up and destroy the old one, burning all the canes and roots in order to kill any insects, or the germs of disease that may be among the old plants. It is much cheaper and the results will usually be more satisfactory to set out a new plantation of such berries than endeavor to renovate and restore an old one. After your snowball bushes have bloomed prune them into any form you desire, cutting out all the old and half-dead wood.

Liquid Manure.—N. Pinkston, Hill Co., Tex.: In making liquid manure to apply to plants in the garden, there is little danger of getting it too strong when made from common stable manure. A half bushel of manure, soaked over night, or longer, in a 40-gallon cask of water, will be about right. Fill up the cask with water, and use this the following day. Poultry manure is stronger than stable manure, and a less quantity will answer, say one peck to 40 gallons of water. Stable manure will lose much of its strength, if left out and exposed to rains; in fact, if left long enough, it will all be washed away, or, at least, all of its soluble parts. The older and more thoroughly decomposed, if kept under cover, the more quickly does it act as a nutriment to plants. But moisture is necessary in its decomposition; consequently, it must not be allowed to become thoroughly dried when under cover, but just enough water added to keep the mass moist and prevent a too high temperature during fermentation.

Mole Traps.—Ned Fessenden, Turner Co., So. Dakota: In the East we have two or three species of the ground-mole which live and burrow under ground, then we have the meadow-mole, a large mouse often destructive to grasses in meadows and the roots of various other plants, but this mole does not make subterranean tunnels like those of the true ground-mole, neither can he be taken with the same kind of trap. "Out West," there are several different kinds of animals which dig holes, and burrow in the ground, known under such local names as gophers and moles. If you refer to any species of the ground-mole, proper, and of the genus *Scalops* or *Condylura*, then you can purchase a good iron or steel trap for less than a blacksmith could get the necessary materials together and make one; besides the traps most in use are patented.

Advantages of Wide-Tired Wheels.—John Rusby, Essex Co., N. J., writes us: "We have had an object lesson on the advantages of wide-tired wagon wheels. When the East Jersey Water Co. were laying water pipes, a large number of them were carted through the main street of our village. The street is macadamized, and, owing to imperfect drainage, had to be repaired. This left considerable loose stone (broken trap rock) on the surface. Now the large and very heavy trucks upon which the pipes were carted had very wide tires, and it was a surprise to see that, instead of rutting, or in the least injuring the road, as they certainly would have done if the tires had been narrow, they actually improved the condition of the road, and left it as smooth as a floor. It is a great pity that something cannot be done to induce the owners of heavy wagons and trucks to have wider tires upon their wheels."

Care of Terrapins.—Henry F. Poor, Honolulu: Several species of terrapins are raised for market. The habits of these species are essentially the same. They all require both animal and vegetable food, such as frogs, crabs, worms, tadpoles and the succulent stems of various water plants. They are easily taken when about to deposit their eggs, in the spring and early summer months. At this time they are brought in immense numbers to the market. The flesh is good at all times, but is most highly esteemed when the animal has been dug out of the mud in a state of hibernation. When penned preparatory to sending to market, they are fed on crabs, oysters and fish, and it is said to add greatly to their flavor to feed them celery for a few days prior to sending them away.

Cream Separators for Small Dairies.—W. S. Muir, Rich Co., Utah, wishes to know whether there is not a cream separator made that a dairyman can afford to buy for a small dairy. He is using the deep-can method of milk setting, but does not think he is getting all the butter he should, and, therefore, would like the separator system if he could make the purchase at a reasonable price. There are a number of hand separators on the market admirably adapted to the wants of small herds. All of them, so far as we know, skim all the butter fat out to the fraction of one per cent. Late experiments in different experiment stations prove that they do far better work with the milk of cows of long lactation than any system of gravity setting. The prices are in the neighborhood of $125. Separator cream is claimed to churn better, that is with less loss in the buttermilk, than cream raised by gravity.

How to Prevent a Mare from Kicking.—W. H. W. C., New Haven, Conn., writes us: To prevent a mare from kicking buckle a strap around her ankles. To the strap attach a rather light chain, say 10 to 12 inches long. This will not mutilate the animal, but when she kicks will give her an educational stinging that will spoil her fun. I have never known this devise to fail.

Skim Milk and Cement Against Rabbits.—L. Port, New York, writes us: If your correspondent who desires to know a safe and sure preventive against rabbits will wash his trees from the ground up as far as the rabbits can reach, using a mixture of skim sweet milk, thickened to the consistency of thick whitewash with water lime or hydraulic cement, he will find that no rabbit will come near them.

Date Culture.—In reply to the inquiry of a California subscriber, Prof. H. E. Van Deman, U. S. pomologist writes us: "While it is quite true that the date will grow very readily from seeds, it is inexpedient to try to propagate it in this way, because the species is dicœcious and a large proportion of the seedling plants will be males. As to the pistillate plants there is no certainty as to what quality of fruit they may bear. The only sure method to secure good fruit is to take suckers from about the base of bearing trees which have proven to be choice varieties. These, when roots are formed, will grow and produce fruit just like the original tree. This method is practiced in date-growing countries. Many growers do not have even one male tree but depend on buying staminate flowers of their neighbors at the proper season. These are tied to the leaf stocks above the clusters of pistillate flowers so that the pollen may fall upon them. One male tree will produce pollen for from 20 to 50 pistillates. Within the last two years a number of suckers from bearing trees, of the very choicest varieties grown in Egypt, Algeria and Arabia, have been imported by the U. S. Department of Agriculture and are now growing in California, Arizona and New Mexico.

Prizes for Shropshire Sheep.—Breeders of Shropshire sheep should write to Mortimer Levering, Secretary of the American Shropshire Registry Association, Lafayette, Indiana, for a list of the special prizes to be awarded to Shropshire sheep at the State and Provincial Fairs in 1892 and at the next American Fat Stock Show in Chicago. At the Chicago World's Fair in 1893, the American Shropshire Association will duplicate each and every premium offered by the Columbian Exposition and the English Shropshire Society (aided by the American) will again duplicate the premiums of the Columbian Exposition, thus trebling the prizes.

American Berkshire Record Free.—At the State Fairs in 1892 the American Berkshire Association offers the first ten volumes of the American Berkshire Record, as a special prize for the best recorded Berkshire sow and litter of not less than five recorded pigs under six months old, bred and exhibited by a resident of the State in which the Fair is held. The same offer is made to the Provincial Fairs of Canada. $1,100 in books will thus be distributed, and a set of the Records may be secured in each State and Province. For information in regard to these special premiums, address: John G. Springer, Secretary American Berkshire Association, Springfield, Illinois.

Dutch Belted Cattle.—At its annual meeting in New York city, the Dutch Belted Cattle Association decided to offer medals to winners of first prize Dutch Belted animals at the World's Columbian Exposition. An exhibit of over 100 Standard-Bred Dutch Belted Cattle has been guaranteed. For information, address the Secretary, H. B. Richards, Easton, Pennsylvania.

Botanical International Congress.—The city of Genoa, Italy, will celebrate the fourth centenary of her renowned citizen, Christopher Columbus, by an International Congress of Geography and Natural Science. The Italian Botanical Society cordially invites botanists from all parts of the world to meet in Genoa, September 4th to 11th,

1892, in a Botanical International Congress, and to take part in the inauguration of the new Botanical Institute of the University of Genoa, and in the opening of an exhibition of Horticulture and of products exchangeable between America and Italy. Excursions on the shores of the Mediterranean and in the Maritime Alps are offered. All inquiries should be addressed to Prof. O. Penzig, R. Università, Genoa, Italy.

The Scientific Alliance of New York.—The scientific societies of New York city have formed an Alliance, for concerted action. The meetings of all the societies are so arranged that dates are not duplicated, and the members of one society can attend the meetings of all the others. There were 12 meetings and four collecting trips during the month of May by the Academy of Sciences, the Torrey Botanical Club, the Microscopical Society, the Linnæan Society, the Mineralogical Club, and the Mathematical Society. Visitors interested in the subjects announced are welcomed at all the meetings of the societies. The announcements for each month are made in a joint folder published by the Alliance, which may be obtained by addressing Prof. N. L. Britton, Secretary of the Council, Columbia College, New York.

Summer School of Botany.—The Torrey Botanical Club of New York City provides each year a Summer Course in Botany at 209 East Twenty-third street, with ten excursions to the country for the study of wild plants, and ten weekly lectures by Henry H. Rusby, M. D., Henry Kræmer, Ph. G., and Thomas Morony, Ph. D. Microscopes and all necessary apparatus are furnished the students of this delightful science.

Feeding Silk Worms on Ramie Leaves.—W. H. Murray, of the California Department of Ramie Culture, informs us that he is experimenting now with five hundred silk worms which are being fed exclusively on ramie leaves. The leaves dry up quickly, but the worms are, and have been, feeding on ramie only for ten days, and are doing well. If ramie proves as good food for silk worms as mulberry leaves are, this discovery will be of immense value to the silk industry of our country.

Planting a Hemlock Hedge.—H. E. Wright, Crawford Co., Pa., writes us that he has planted hemlock trees for screens at all seasons of the year, and finds that from the tenth of May until the middle of June is the best time for planting in the Northern States, and that, if the young trees are properly planted, the character of the soil makes but little difference. The great point, in planting these evergreens, is not to expose the fine roots to the sun, not even for a single minute.

A Sweet Pea Experiment Station.—Rev. W. T. Hutchins, Hampden Co., Mass., sends us the map of his sweet pea garden, in which are planted in equal plats thirty distinct named varieties of sweet peas, comprising all the latest and most beautiful kinds.

Rotation in the Garden.—W. A. Graham, Randolph Co., Ind., writes us that in the West, where fertilizers are rarely used, farmers have to change their gardens from one spot of ground to another, if they expect to keep up a supply of vegetables; but a decided improvement in this direction is to have the garden so large that one-half of the ground can be kept in red clover, sowing the seed at the rate of one peck to the acre. Allow the clover to make as good a growth as possible, and the following spring plow it under for the crop of vegetables. Then sow the other half of the garden to clover, to be plowed under the following season, repeating the operation from year to year.

The Largest Hen's Egg.—Rev. A. T. D. Haupt, Ramsey Co., Minn., writes us that he keeps a few hens for his own use—some Partridge Cochins, and some White and Black Leghorns. One day he found in the nest an egg three inches long and two inches wide. The long circumference was eight and one-eighth inches, and the short six and one-half inches. The egg weighed a little over one-quarter of a pound. What the Doctor wants to know is whether any one has ever seen a larger hen's egg than this.

Protection Against Rabbits.—Paul Deitz, Suffolk Co., N. Y.: In reply to your inquiry as to the liability for killing rabbits on your premises, J. B. Story states that the law protects the owners of orchards and nurseries as follows: "Owners and occupants of orchards and nurseries in any of the counties of this State may trap or hunt hares or rabbits, with ferrets or otherwise, within the limits thereof, or any field or forest adjoining such orchards or nurseries, and will not be liable for the possession of any hare or rabbit taken or killed within the limits aforesaid."

Bald Barley for Poultry.—M. W. Miles, Douglas Co., Wash.: The reason why your poultry did not eat the bald barley was because they preferred the corn. Chickens will not eat oats, and will often refuse wheat, when they can get corn. If they had not had the corn they probably would have been glad to get the barley.

The Largest Fowls.—J. G. Longfellow, Kent Co., Del.: The Light Brahma probably grows to the largest size of any breed of fowls. The "Black Astrachan" we know but little about. It is claimed to reach great size, but a friend of ours hatched two chickens of this breed, and he declares that they were nothing more or less than Langshans. At any rate, they looked like Langshan chickens when hatched. They did not live to grow up. The Light Brahma is the largest of standard breeds, and as heavy weights have been claimed for it, so far as we know, as for the Black Astrachan.

Color of Yolks of Eggs.—S. W. Hibberd, Morris Co., N. J.: If you will feed some wheat and give your fowls plenty of green clover, the yolks will be darker in color. Clover has the same effect on yolks as green grass has on the color of June butter.

Poultry Queries.—A. C. Guernsey, Montgomery Co., Kansas: The soft feathers are the most valuable, as they are more or less used in the making of mattresses and pillows. If white in color, they are frequently mixed with geese feathers. Featherbone is manufactured from quill feathers. Farmers—if the manure is free from earth—use hen and pigeon manure, the latter being preferred. If you have a large quantity it might be profitable to advertise it for sale. Your incubator chicks did not die of leg weakness, but probably from some other cause. While feeding eggs, graham muffins, potatoes, and meat, ground fine, was not bad, if you had given bread and milk, small seeds like millet, a little ground meat, and very finely-cracked corn and wheat, had kept the chickens supplied with grit and pure fresh water, and had kept the temperature of the brooder at about 90° the first week, 85° the second, and 80° the third, it is probable that you would have had better success. There is a knack in raising incubator chickens; it comes from experience, and not by nature, and you need not be surprised that you made a failure. Many others have done the same at the start.

Keeping Lard.—J. L. Moultrie, Bullock Co., Ala. To keep lard sweet it should be put in good well-glazed stone jars. Barrels are almost certain to leak, and tin will soon turn the lard next to the can yellow and rancid. To a common sized wash-pot holding from ten to twelve gallons of fat, one-half pint of common dripped lye is to be added if the lard is to be kept for any length of time. This will cause all the impurities to rise to the top, where they can be skimmed off easily, and the lard itself will be as white as snow.

A Model Farmers' Club.—One of the most successful Farmers' Associations we have any knowledge of is the Bedford Farmers' Club, Westchester Co., N. Y. The meetings are held the second Wednesday of each month at the homes of the members, who extend an invitation. The subjects for discussion cover a wide range and are selected with great care and judgment. The neat little prospectus before us contains the list of subjects for the year, namely: "Can Peaches be Successfully Grown for Market in Westchester County?" "Will the Large Breed of Cattle be as Profitable in the County as the Natives or Ayrshires?" "Vegetable, Fruit and Flower Gardens"; "The Advantage of State Aid for the Improvement of Country Roads"; "The Condition of Agriculture in the State of New York Compared with European Countries"; "Imparting a Taste for Country Life to Children in our Public Schools"; Is it More Profitable to Raise Our Cows than to Purchase Them?" Can Pear Orchards be Made Profitable in Westchester County?" "Economica' Methods to Resist the Invasion of Noxious Weeds"; "Large or Medium Sized Horses for Farmers"; and "Should we Raise or Purchase Our Bread Stuffs?" The various subjects are to be introduced by experts in these specialties, and the discussions which usually follow bring out a vast amount of practical and useful information. So influential has this club become that on the days of these meetings the town assumes almost a half-holiday appearance.

Callas for the Holidays.—L. B. P., Boston, Mass., writes us that he plants his callas in the open ground when the weather becomes warm in spring, and gives them no especial attention until September, when they are lifted and carefully potted. Three plants are put into a seven-inch pot, or twelve larger plants into an ordinary soap box. The earth usually consists of one-third well-rotted cow manure and two-thirds good garden soil. The plants are kept dormant for about one month, when they are given considerable heat and plenty of light and air. When the buds begin to appear, liquid manure is applied from time to time. With this treatment an abundance of flowers may be expected for Christmas and New Year's.

An Experiment with Canada Thistles.—L. M. Ebert, York County, Pa., writes us that after having failed, repeatedly, to exterminate Canada thistles, he fastened a half-inch chisel to a long handle, and cut all the stalks about one-half inch below the surface. This was done whenever the weeds appeared above the ground. The result of this is that this summer hardly a thistle is to be seen on the land. On a small scale this plan is quite effective, but it would hardly be feasible when the thistles have spread over many acres.

Raising Pea Fowls.—L. M. Smith, Custer Co., Mont.: Common hens will not hatch eggs of pea fowls, and eggs that have been transported from a great distance seldom hatch. The surest way to raise a stock of these fowls is to secure a pair and then raise the chicks yourself.

To Prevent Cows from Kicking.—Edwin J. Doty, Meager Co., Mont., writes us that of all the methods that he has tried to prevent cows from kicking, the most certain is to take a small rope about twenty feet long, with a loop in one end, throw it over the back and across the loins, and get hold of the loop with a stick if the cow is unruly. Bring it just in front of the udder, pass the rope through the loop and draw tight, then stand off the length of the rope and let her have her "buck out," and then go up and tie firmly. It is impossible for a cow to kick with this contrivance on. After a few days the rope may be put on more loosely, until dispensed with entirely. I have tried it on all kinds of cows, and it has always proved a success. It will also break a cow of the habit of moving around the yard while being milked, as it is painful for her to take a step while the rope is on.

Exterminating Purslane.—The fact that a single plant of "pusley" produces some times more than one million seeds, is not the only reason why it is so difficult to exterminate. Its greatest injury results from the fact that it will retain its vitality and ripen its seeds after becoming detached from the soil. Hence, one may think he is done with it, after having laid it low under a hot July sun. But it goes on fulfilling its mission of evil, and after the next shower a hundred plants start up where there was formerly but one. It is most troublesome in garden crops, such as onions, that do not shade the ground much, but does comparatively little harm among corn and potatoes. If the land infested with it is steadily cultivated so that the plants are never allowed to become more than an inch high, it may be eradicated by this means. If allowed to get larger it is almost sure to ripen its seed.

The Dorset Horn Sheep Breeders' Association of America have issued the Dorset Horn Sheep Annual for 1892. A history is given of the formation of this new breed from the native Dorset sheep of England, and of its recent introduction into the United States and Canada. A list of members and of transfers, and the rules for registration are presented by the Secretary, M. A. Cooper, Washington, Pa.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

JUNE, 1892.

Money for Agriculture.

The appropriation bill for the United States Department of Agriculture, now pending, shows little indication of a desire on the part of Congress to enable this Bureau to fully develop its field of usefulness. The same insufficient sum as in former years is asked for the work of the statistical division. Even for collecting reports on crop area and production in foreign countries, the usual paltry $2,500 is provided. When so much depends upon the crop prospects and yields in foreign countries, as governing the export demand for our own surplus, it is remarkable that such inadequate provision should be made for ascertaining the facts. The exhibit elsewhere made of the errors incident to the work of the crop-reporting bureau, with its present limited facilities, emphasies the need of providing more funds for a better service.

It is true that the Bureau of Animal Industry asks for a million dollars this year, instead of half that sum, as heretofore, but the extra $500,000 is required to meet the expense involved in the new inspection of live cattle and hogs and the carcasses and products thereof, which are the subjects of interstate and foreign commerce. The value of this inspection has already been demonstrated.

The pending bill is especially faulty in the treatment of the Weather Bureau, the appropriation for which this year is even less than last year. The finance committee appear to have no conception of the interest taken in the weather service, and the way in which the farmers throughout the country want it extended. Even if the number of paid weather observers is not increased, the service is now so accurate, and the number of volunteer observers is daily increasing in number so rapidly, that every reason exists for providing liberally for disseminating the results of the service among the people. As every one knows, the weather predictions, frost warnings, and cyclone guards are valuable only according to the promptness with which they are laid before the community.

That the public appreciates this point, and also recognizes the enormous benefit the weather service can be to them at present, is shown by the great number of applications constantly made upon the Weather Bureau for the daily service. Since the AMERICAN AGRICULTURIST for March brought this matter directly to the attention of the rural public, the Weather Bureau has received over 500 applications for additional display stations, which must be denied for lack of funds. The number is increasing daily, and it is probable that within 12 months there will be over 1,500 such applications, all of which must be denied unless the new appropriation is materially increased.

Not less than 2,300 distinct and separate organizations of farmers have more or less directly expressed a desire to coöperate with the Weather Bureau and utilize its information. In fact, wherever farmers are organized they want to secure the daily telegraphic report of weather predictions, to be so publicly displayed from flag stations or otherwise as to be known to the whole community. In return for this service they are willing to furnish voluntary observers and reporters, thus securing the best results at practically no expense, except the cost of telegrams, printing, and other items involved in disseminating the reports. For this latter purpose, the proposed appropriation is no larger than previously, whereas it should be at least doubled. Unless this increase is provided, the great agricultural public, who most need the weather service, will be denied its benefits, for it should be emphasized here that the display signals at present are mostly in the larger cities and towns, whereas it is out in the country that they are most needed.

The AMERICAN AGRICULTURIST calls the attention of Congress to this particular item of the agricultural appropriation bill, confident that liberal provision will be made for disseminating the reports and warnings of the Weather Bureau.

The Duty of the Hour.

The prospect is not flattering for the passage of the Paddock Pure-Food bill by the House of Representatives at Washington in the form in which it was enacted by the Senate. A bitter opposition is being fomented by makers of adulterated foods, who are leading druggists and others to believe that the bill prohibits the manufacture and sale of all proprietary medicines and other patent preparations. Of course the measure does nothing of the kind, nor does it interfere with commerce within the State or supersede State authority regarding food inspection and punishment for adulteration. Every one interested can get a copy of the bill on application to their Congressman, and satisfy themselves as to its value.

The anti-option bill may be reached in the House of Representatives ere this issue of the AMERICAN AGRICULTURIST is read, but days are likely to be spent in filibustering against the measure. As reported by the committee the bill is free from the objection that it will interfere with legitimate trade. It taxes out of existence the "short seller," and thus reaches an evil which it might not be constitutional to directly prohibit. The fight against the measure is led by the New York Produce Exchange, the Chicago Board of Trade and the New Orleans Cotton Exchange, who, with the allied interest of brokers and bankers, are able to spend immense sums against the measure.

Both the Senate and the House committees on post office affairs have reported in favor of an appropriation for extending the delivery of mails in country districts. The House committee has also reported a bill providing a fractional postal currency, to be issued at par at every post office, and to be legal tender for six months from date of issue. The very simple plan thus insures getting this great convenience directly into the hands of people in the back country regions who most need it.

It is the duty of the hour for every farmer and other person interested in these questions to at once write their Representative and Senator at Washington to support them. This direct appeal by the people to their agents in authority is the most proper and effective way of enforcing the popular will.

The Lessons of the Census.

The astounding and unexpected increase in the acreage of oats in several of our Western States is the most striking immediate revelation of the census of cereal crops, so far as the returns have been made up. The corresponding falling off in the wheat area was also more than had been discounted. In view of resulting low prices, the wise farmer will curtail his area of oats in future, especially in the Central and Western States.

It is useless to undertake to interpret the lessons taught by the returns on corn and wheat until these returns shall have been completed for all the States. The figures elsewhere printed will arouse deep interest and much speculation as to the relationship of production to consumption. Every farmer will do well to study these statistics as they appear, for they are material evidence of otherwise uncertain influences upon which his welfare and future so much depend.

One great lesson may, however, be drawn from the census of cereals as partly reported. This lesson is that no amount of genius in estimating will take the place of actual facts in crop reporting. The need of an annual farm census is more clearly demonstrated than ever. We regret the subsidence in agaitation for a permanent census bureau or for the extension of the statistical work of the Department of Agriculture in this direction. It should be, and we believe is, feasible to secure promptly, a comparatively accurate annual census of the area in staple crops. Then, with still more care in getting at average yields per acre, much of the present inaccuracy and uncertainty as to total production could be dispensed with.

A Significant Movement.

The agitation for better roads is not confined to our city brethren, as their advocates would have us believe. The farmers throughout the country are fully aroused on this subject. Our reports from the West, printed on another page, show that in that section they are taking hold of the work in the direct, practical way that characterizes the progressive American farmer. The excellent suggestion is made that a part or the whole of the income from liquor licenses, and also from a State tax on inheritances, be devoted to the construction of better roads. Either plan would provide for constructing and maintaining good roads without materially adding to the unjust proportion of taxes now borne by the farmer. As a temperance measure, also, the suggestion is not without importance.

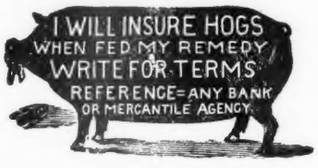
We urge every community, large and small, and in every section of the country, to discuss and agitate this problem. Reports of actual progress in building better roads are solicited, as we wish to be kept informed of every effort in this line. All our readers will please consider it their duty and privilege to report every instance of the kind in their vicinity, or that they know of, to the AMERICAN AGRICULTURIST.

STOP THE LEAKS.

The annual loss of hogs by disease, if prevented, would have paid off the mortgages on many farms.

THE RELIEF IS CLEAR.

USE DR. JOS. HAAS'



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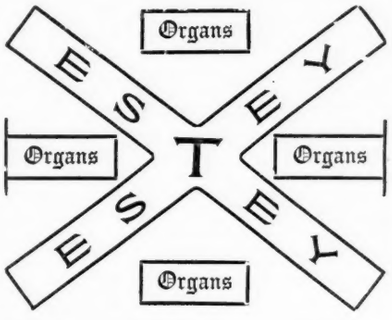

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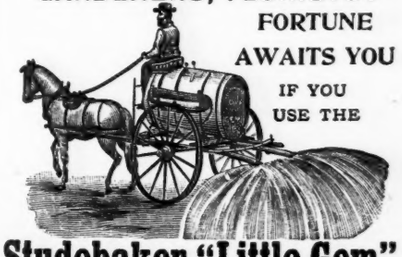

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MATTERS OF BUSINESS.

The Census of Cereal Crops.

Some remarkable changes in the area devoted to our staple crops are revealed by the census of 1889. The figures are only partly at hand, but, so far as advance sheets have been received from the Census office the appended table gives totals by States of the area and yield of wheat, corn, oats, rye, buckwheat, and barley, in the census year 1889, compared with the census of 1879.

The Change in Wheat Area must arrest attention. Observe that even in Illinois nearly one million acres less were devoted to wheat in 1889, a reduction of nearly 33 per cent. Indiana's wheat acreage shows no material change beyond what is likely to appear from year to year. But that Iowa should have had only one-fifth as much land in wheat as she had in 1879 is indeed extraordinary. The sister State, Nebraska, also shows a reduction of quite one-half in her breadth of wheat during the same time. This is an unprecedented change, all the more remarkable because totally unexpected. The accepted official reports of the United States Department of Agriculture credited Iowa and Nebraska with a total of just over 3,000,000 acres of wheat, whereas the census of every farm could find less than half that quantity—only 1,384,403 acres. The Kansas loss in wheat area was not great nor unexpected. Colorado doubled her wheat area, having 50 per cent. more acres in this crop in 1889 than government crop reports indicated. The Pacific coast area has enormously increased—from 2,359,000 to 3,767,000 acres. Here is a growth of 60 per cent., but expectations based upon official crop reports indicated a gain of 93 per cent.

Taking the first group of States—Illinois, Indiana, Iowa, Nebraska and Kansas—we find the breadth of wheat to have been 7,777,000 acres in 1889, a total reduction of 4,432,000 acres, or about 30 per cent. The increase in wheat on the Pacific slope during this period, 1,408,000 acres, leaves a net reduction for the eight States of over 20 per cent., or three million acres of wheat during the decade.

Corn Has Gone West faster than the farmers of the Central States may like to admit. Illinois, long the prominent corn State, curtailed its breadth of corn over a million acres during the decade, and in 1889 was but a trifle ahead of Iowa and Kansas, and this year, probably, both of these States have planted more acres to corn than Illinois. No change in corn area appears to have occurred in Indiana, and Iowa increased less than a million acres, or 14 per cent. (about half as much as government crop returns indicated). But Nebraska more than trebled and Kansas more than doubled their corn area. These five great corn States together counted up almost 32,000,000 acres in maize, against something over 42,000,000 acres 10 years earlier. The increase is 7,465,000 acres or 23 per cent.

Oats Furnish the Most Remarkable Exhibit.—They have more than taken the place of wheat. In the five great cereal States noted, oats occupied 4½ million acres and wheat over 12 millions in 1879, but 10 years later the census shows nearly 12 million acres of oats, and less than eight millions of wheat. The total increase of lands own to oats was 6,893,000 acres in the five States, or 144 per cent. The gain in number of acres was almost as great as with corn, while proportionately the oat area developed nearly seven times as fast as the corn breadth in these States. Not much oats is produced on the Pacific slope, but the net increase of 42 per cent. was over 100,000 acres, while in that region corn increased only 9,240 acres, or 12 per cent.

The Yield of all Cereals in the census year was decidedly above the average, especially in the case of corn and oats. The table next to this shows the details of the enormous increase in production in the States of largest added area. Illinois, Indiana, Iowa, Nebraska and Kansas together produced 1,187 million bushels of corn—300 million bushels, or 25 per cent., more than in 1879. But their production of wheat was only 124 million bushels, or a shrinkage of 37,000,000 bushels (22 per cent.) in the ten years. Although the Pacific slope produced 56,513,000 bushels in 1889 against 38,419,000 ten years earlier, the increase would make up for only half the loss in the five States mentioned, or a net decrease in production for the eight States of 19 million bushels, and 9½ per cent.

The yield of oats in the group of five States was, like the acreage, nearly three times as large as ten years earlier. Indeed, these States produced over 404 million bushels of oats in 1889 against only 144 millions reported by the tenth census, an increase of 260 millions, or 180 per cent. Is it any wonder that the price of oats has so rapidly declined.

THE CENSUS OF CEREAL CROPS.

	Acres. 1889.	Acres. 1879.	Acres. Dif.	Bushels. 1889.	Bushels. 1879.	Bushels. Dif.
ILLINOIS.						
Barley	41,390	55,267	—13,877	1,197,206	1,229,523	—32,317
Buckwheat	9,761	16,457	— 6,696	107,066	178,859	—71,793
Corn	7,860,917	9,019,381	—1,158,464	289,629,705	325,792,481	—36,162,776
Oats	3,848,897	1,959,889	+1,889,008	137,602,804	63,189,200	+74,413,604
Rye	165,589	192,138	—26,549	2,627,949	3,121,785	—493,836
Wheat	2,239,861	3,218,542	—978,681	37,371,081	51,110,502	—13,739,421
Total cereals	14,164,415	14,461,674	—295,259	467,339,802	444,622,350	+22,717,452
INDIANA.						
Barley	10,280	16,399	—6,119	350,200	382,835	—32,635
Buckwheat	9,548	8,846	+702	99,959	89,707	+10,252
Corn	3,585,570	3,678,420	—92,850	108,830,012	115,482,300	—6,652,288
Oats	1,102,256	623,531	+478,725	31,489,264	15,599,518	+15,889,746
Rye	62,888	25,400	+37,488	877,516	303,105	×574,411
Wheat	2,569,702	2,619,695	—49,993	37,316,341	47,284,853	—9,968,512
Total cereals	7,340,244	6,972,291	+367,953	198,963,292	179,142,318	+19,820,974
IOWA.						
Barley	518,729	198,861	+319,868	13,406,122	4,022,588	+9,383,534
Buckwheat	25,243	16,318	+8,925	286,746	166,895	+119,851
Corn	7,585,522	6,616,144	+969,378	313,130,782	275,014,247	+38,116,535
Oats	3,752,141	1,507,577	+2,244,564	146,679,289	50,610,591	+96,068,698
Rye	93,707	102,607	—8,900	1,445,283	1,518,605	—73,322
Wheat	585,548	3,049,288	—2,463,740	8,149,787	31,154,205	—23,004,418
Total cereals	12,560,890	11,490,795	+1,070,095	483,098,009	362,487,131	+120,610,878
NEBRASKA.						
Barley	82,590	115,201	—32,611	1,822,111	1,744,686	+77,425
Buckwheat	15,358	1,666	+13,692	120,000	17,562	+102,433
Corn	5,480,279	1,630,660	+3,849,619	215,895,996	65,450,135	+150,445,861
Oats	1,503,515	250,457	+1,253,058	43,843,640	6,555,875	+37,287,775
Rye	81,372	34,297	×47,075	1,085,083	424,348	+660,735
Wheat	798,857	1,469,865	—671,010	10,571,059	13,847,007	—3,275,948
Total cereals	7,961,969	3,502,146	+4,459,823	273,337,889	88,039,609	+185,298,280
KANSAS.						
Barley	7,201	23,993	—16,792	165,715	300,273	—134,558
Buckwheat	6,907	1,358	+4,449	67,115	24,421	42,694
Corn	7,314,765	3,417,817	+3,896,948	259,574,568	105,729,325	153,745,243
Oats	1,463,528	435,859	+1,027,667	44,629,039	8,180,385	36,448,649
Rye	199,140	34,621	+164,527	2,917,388	413,181	2,504,205
Wheat	1,582,635	1,861,402	—278,767	30,399,871	17,324,141	13,075,730
Total cereals	10,574,180	5,776,150	+4,798,030	337,753,689	131,971,726	205,781,963
COLORADO.						
Barley	12,080	4,112	+7,974	331,550	107,116	+224,440
Buckwheat	117	8	109	2,081	110	+1,971
Corn	119,310	22,991	+96,319	1,511,907	455,968	+1,055,939
Oats	87,959	23,023	+64,936	2,514,480	640,900	+1,873,580
Rye	4,615	1,294	+3,321	54,158	19,465	+34,693
Wheat	126,990	64,693	+62,306	2,845,439	1,425,014	+1,420,425
Total cereals	351,086	116,121	+234,965	7,259,621	2,648,573	+4,611,048
MONTANA.						
Barley	4,652	1,323	+3,329	160,902	39,970	+120,932
Buckwheat	13	34	—21	128	437	—309
Corn	1,019	197	+822	14,225	5,649	+8,576
Oats	52,768	24,691	+28,077	1,535,615	900,915	+634,700
Rye	14	15	—1	188	430	—242
Wheat	18,696	17,665	+1,031	457,607	469,988	—12,081
Total cereals	77,162	43,925	33,237	2,168,665	1,417,089	+751,576
CALIFORNIA						
Barley	815,995	586,350	229,645	17,548,386	12,463,561	+5,084,825
Buckwheat	664	1,012	—348	10,388	22,307	—11,919
Corn	70,303	71,781	—1,478	2,381,270	1,993,325	+387,945
Oats	57,569	49,947	+7,622	1,463,068	1,341,271	+121,797
Rye	27,413	20,281	+7,132	243,871	181,681	+62,190
Wheat	2,840,807	1,832,429	+1,008,378	40,869,337	29,017,707	+11,851,630
Total cereals	3,812,751	2,561,800	+1,250,951	62,516,320	45,019,852	+17,496,468
OREGON.						
Barley	37,803	29,311	+8,492	875,063	920,977	—45,914
Buckwheat	.....	372	—372	.....	6,215	—6,215
Corn	.....	5,646	—5,646	.....	126,862	—126,862
Oats	218,736	151,624	+67,112	5,948,594	4,385,650	+1,562,944
Rye	.....	1,841	—841	.....	13,305	—13,305
Wheat	553,270	445,077	+108,193	9,298,224	7,480,010	+1,818,214
Total cereals	829,005	632,871	+196,134	16,121,881	12,933,019	+3,188,862
WASHING'N.						
Barley	51,551	14,680	+36,871	1,269,140	566,537	+702,603
Buckwheat	.....	106	—106	.....	2,498	—2,498
Corn	.....	2,117	—2,117	.....	39,183	—39,183
Oats	65,089	37,962	+27,127	2,273,182	.....	.....
Rye	.....	518	—518	.....	7,124	—7,124
Wheat	372,658	81,554	+291,104	6,345,426	1,921,322	+4,424,104
Total cereals	500,671	136,937	+363,734	.....	4,809,846	.....
KENTUCKY.						
Barley	5,806	20,089	—14,283	168,759	486,326	—317,567
Buckwheat	603	1,024	—421	8,559	9,942	—1,383
Corn	2,960,240	3,021,176	—60,936	78,430,007	72,852,263	+5,577,744
Oats	645,307	403,416	+241,891	8,775,754	4,580,738	+4,195,016
Rye	45,546	89,417	—43,871	423,847	668,050	—244,203
Wheat	898,694	1,160,108	—261,414	10,707,462	11,356,113	—648,651
Total cereals	4,556,196	4,695,230	—139,034	98,514,388	89,953,432	+8,560,956

Some One Has Blundered.

A special effort was made to secure an accurate census of the great staple crops of the country in the Eleventh Federal Census, for the crop year, 1889, which was taken in June, 1890. There is every reason why we should accept the census returns as being as accurate as it is possible for such data to be collected by a census bureau constituted as it is in this country. In some States the census returns of average yield per acre (obtained by dividing the total production by the number of acres devoted to the crop) is very close to the yield per acre estimated by the bureau of statistics of the United States Department of Agriculture for the crop of 1889. This will be seen in the following table, in which the column headed "C" indicates the yield per acre as found by the census, and the column "D" the Department's estimate for 1889:

	Corn. C.	Corn. D.	Wheat. C.	Wheat. D.	Oats. C.	Oats. D.	Rye. C.	Rye. D.
Illinois	36.8	32.0	16.7	16.0	35.7	37.5	15.9	15.4
Indiana	30.4	29.0	14.5	14.7	28.6	27.7	13.9	11.3
Iowa	41.3	38.3	13.9	13.1	39.1	34.5	15.4	14.6
Nebraska	39.4	37.8	13.2	12.0	29.2	31.6	13.3	13.5
Kansas	35.5	37.5	19.2	18.4	30.5	31.5	14.7	17.5
Colorado	...	....	22.4	....	28.6	....	11.7	....
Montana	...	....	24.5	....	29.1	....	13.4	....
California	33.9	28.2	14.4	15.0	25.4	25.0	8.9	....
Oregon	19.7	20.0	16.8	16.5	27.2	25.7	9.2	....
Washington	16.3	....	17.0	....	34.9	....	10.9	....
Kentucky	26.5	26.5	11.9	11.0	13.6	18.5	9.3	....

A wide discrepancy appears in some cases, but a sufficiently close agreement of the two authorities occurs in other cases, to in a measure, compensate. This shows that the experienced farmers who report to the Department of Agriculture at Washington, and Statistician Dodge, who interprets these reports, are more likely to get at a correct statement of the yield per acre than they are to accurately deal with area.

In fact, the changes in area in States where there has been any material change, as shown by the census, are so very different from the Department's estimates as to demonstrate the inaccuracy of the Department's system under such circumstances. This is not so much a reflection on Mr. Dodge as it is on the inability of his bureau (from lack of funds) to extend its work in such States sufficiently to account for the abnormal changes. He recognized this fully in his report for December, 1889, when, in discussing the decline of wheat growing in Iowa, he said: "Whether this great discrepancy represents the full difference in these crop areas can only be determined by a thorough census, as the great changes that have occurred in this fertile and progressive district are very demoralizing to the method of annual comparison by estimates."

How strikingly true this remark is appears from the fact that the Department's estimate of the wheat area in Iowa in 1889 was 108 per cent. too high. In other words, the actual acreage was only one-third as much as was estimated. In the same State the breadth of corn was estimated by the Department at 16 per cent. more than the census actually shows, a discrepancy of over a million acres. Naturally, also, the area of oats in Iowa, which so largely took the place of wheat and corn, was correspondingly underestimated, being one million acres more than the Department of Agriculture returned it at—a discrepancy of 26 per cent. in area and 32 per cent. in yield. The details of this data for the three staple crops in the five States of large production appear in the table on Page 394.

This table shows the discrepancy in area and yield between the census and the final estimate of the United States Department of Agriculture for

(*Continued on Page* 394.)

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As Soon be Dead

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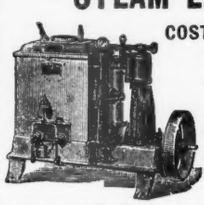

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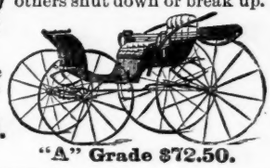

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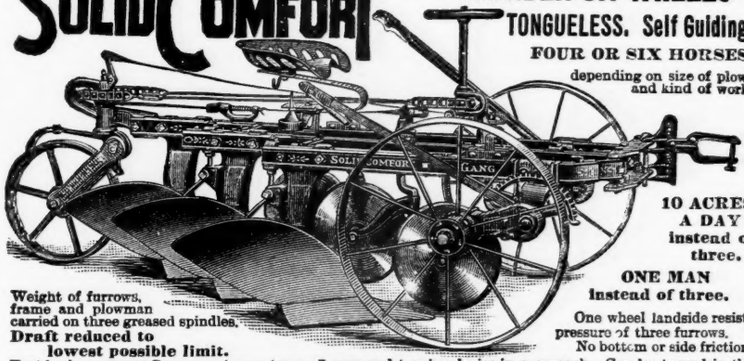

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ANIMAL AILMENTS.

Stiff Horse.—A Subscriber, Longmont, Col., has a horse that is stiff in all his joints. In the morning, after a moderate day's work, he is so stiff that he can hardly get out of the stable. His feet are sound. He seems sore in the chest, and acts as though he would have string halt. He stumbles badly. What will cure him? The treatment is one thing, and cure a very different matter. At first, give daily for a week, aloes, half a dram; asafœtida, gentian, ginger, of each one dram; molasses, to make a ball. To be followed by sweet spirits of niter, two ounces; Fleming's tincture of aconite, five drops, in wafer twice daily for a week. Blanket, and keep out of a draft.

Splinter in the Eye.—J. B. Bratney, Randolph Co., Ill., has a three-year-old mare in foal that had a splinter run into the eye just above the ball. It was removed. It suppurated freely, but left inflammation of the eye. Bathe with hot water, or hot white oak bark infusion. Carefully examine the wound to learn if there is not a sliver still there. Give a quarter of a pound of Glauber's salts in the bran mash for three or four nights. Feed no corn. A handful of whole flaxseed in two quarts of oats at noon, will do well. Should the inflammation not be entirely removed after a week, paint with iodine a spot as large as the palm of the hand every day behind the ear.

Sliver in Tongue of Horse. — A. A. Horn, Cuyahaga Co., Ohio, desires information as to "what has caused the inflammation and swelling of the tongue of a very valuable trotting stallion? It was first noticed that the horse ran out the tongue very often, and that he seemed to have trouble in eating hay and oats. After a week or ten days, a hard fit of coughing seemed to break a gathering, and the horse spit out the substance which I inclose. I will be grateful for an explanation of the cause of this ailment." The substance sent us was found to be a sliver of pine wood, to which coagulated lymph was adhered, which covered and obscured the substance. This is an important case, because many valuable horses have been destroyed by slivers thrust into the tongue, fauces, or other part of the mouth. Horses, especially those highly fed and thoroughly groomed, or pampered animals, become nervous, and acquire a habit of biting or nibbling at any wooden substance within their reach, such as the manger, partition, stall, post, fence, or anything within reach. In such cases, the mouth and tongue should be carefully examined, and when any foreign substance can be found, it should be removed with the sharp point of a knife, the blade of which has been carefully wound with twine to prevent cutting the mouth. If it cannot be removed, the sharp point of the knife should cut across the point two or three ways, so as to induce inflammation that would remove the "thorn in the flesh," that is producing the serious trouble. A bold hand should be used, as it will relieve the trouble speedily.

Diarrhœa in Lambs. — M. C. Shade, Stutsman Co., N. Dak., has lost a large number of lambs, and a few ewes, from diarrhœa. Look to the food. Dry, clean, sound hay, and ground oats, should be given in moderate quantities, and at regular intervals. Try the following remedy: Prepared chalk, one ounce; powdered catechu, half an ounce; powdered Jamaica ginger, two drams; powdered opium, half a dram; peppermint water, half a pint. Put in a bottle, shake, and then give a tablespoonful night and morning. Older lambs and sheep require proportionately more.

Loss of Calves.—L. P. Hubbard, Litchfield Co., Conn., lost two calves during the period of fattening for veal. The calves were fed the milk from the pail. One was constipated. The milk was fed cold, probably, and was too greedily drunk. Warmed milk may be fed from the pail by putting two or three smooth stones in the pail to prevent too greedy feeding. To prevent constipation, give bran tea, made by pouring hot water through the bran in a small bag. Linseed meal may also be added to the milk, or, if preferred, to the bran in the bag with a teaspoonful of table salt. The linseed meal should be given in tablespoonful quantities at first, then gradually increased. It will be better to feed three times daily, instead of twice. A calf's feeding pail should be daily scalded with boiling water. From the fact, as stated, that the calves died immediately after drinking, points plainly to strangling as the cause of death. Many cows are kept for suckling veal-calves. But from injury to the udder of expensive cows, it is not so advisable as feeding by pail. During a season, we have known a profuse milker to have fattened seven veal-calves. Raw eggs, half a dozen, beaten with the milk, for a week before sale, render the veal-meat white, which brings a higher price in a fancy market.

Obstructed Back Teats on Cow.—A. S. Morgan, Owachita Co., Ark., has a cow that has occlusion of both back teats. There is no remedy for chronic occlusion of the teats of cows. If the cow gives as much milk from two teats as from four it may do to keep her, but if anything happens to the other teat, a cow with only one will not pay except for beef.

Abortion in Three Jersey Cows.—William D. Sell, Adams Co., Pa., writes that he has three Jersey cows that have "slunk" their calves. They were fed on corn meal and wheat bran three times a day. From the fact that three cows of the same herd failed to complete gestation, it is evident that the cause in each must have been the same. First change the feed, then clean and whitewash the stable with plenty of crude petroleum in the whitewash, and do not breed them for three months. The feed may be ground oats, wheat middlings, or any of the by-fodders, as sweet grains, or dried grains, starch feed, linseed meal, and grass mainly. If the cows are delicate or feeble, add to each mess a tablespoonful of powdered gentian. Cows too finely inbred are more subject to abortion. If there is any ascertainable cause for the trouble, it should be removed. As the period of pregnancy and other facts were not stated we can not at present advise farther.

Garget.—Henry I. Meyer, Brown Co., Minn., had a six-year-old Jersey cow with a badly swollen udder that did not yield to rubbing with hot lard and liniment. The milk has dried up. The inflammation has destroyed the udder glands, and the only remedy will be to fatten the cow for beef. The most active treatment often fails to restore the udder.

Infection of Omasum.—M. R. Korl, Queens Co., N. Y., has a cow that is drooping, dull and has entirely lost her appetite and milk. Her horns and ears are cold at their roots, she hangs her head and drools glazy saliva. Being a great favorite with the hired man, who takes the best of care of her, she has never lacked food. The probability is that the cow has been overfed, and one compartment of the stomach has become fevered, causing the food to become dried and hardened. Small doses of linseed oil should be given three times daily and no food of any kind. A pint of warm linseed tea may be administered three or four times a day. Enemas are of little service, the trouble is too far off.

Diarrhœa In Calves.—Many inquiries come at this season of the year asking how to cure diarrhœa in young calves. Too often this effect is produced by neglect to scald the milk pail in which the calves are fed. In early calf life, though the calf has four compartment-stomachs, yet the fourth, or true stomach, has nearly all the digestive function to perform. The digestive apparatus of young animals is highly organized with nerves and blood vessels, and is, in consequence easily deranged. Moreover, the stomach and bowels sympathize with the skin. Over feeding, fast feeding, sour and decomposing milk, left from last feeding in the pail, sudden chill from exposure from rain, wind and wet ground, all may induce diarrhœa in young calves. Even Jersey calves suffer from too much and too rich milk. It is best to give calves their mothers' milk. Any sudden change may produce baneful results. All newly-born calves should be suckled by the mother for two or three days, as the first milk contains the natural physic designed for the removal of the meconium, or black, sticky accumulations in the bowels of newly-born calves. If not thus removed, it excites irritation of the delicate mucous membrane of the bowels. Weak calves, and calves of delicate and feeble mothers, or those having diarrhœa or consumption, are most subject to diarrhœa. If the calf's breath smells sour, the stomach secretes too much acid. Half a teaspoonful of bicarbonate of soda will correct the state of the organ when given in the milk at feeding time. A tablespoonful of infusion of gentian is a grateful tonic to the calf's stomach. The infusion is made by boiling half an ounce of bruised gentian root in a pint of water for 15 minutes. Keep the calf loose, in a dry, sunny stall nurse the young thing, and when necessary give calcined magnesia one-half ounce, powdered opium one to two grains, powdered rhubarb one dram once or twice. Boil the milk and feed slowly by putting clean stones in the feed pail. Lime water, a lump of lime put into a bottle filled with water, is easily made, for lime is only very sparingly dissolved in water. If the diarrhœa be troublesome, a teaspoonful of laudanum in the milk will restrain it. A calf should be kept growing throughout its calfhood, summer and winter. This brings a vigorous constitution to long life-service of the cow for the dairy, for family or for breeding purposes. We must lay the foundation for usefulness in animals when young. Most of our best cows owe their excellence to care and judicious feeding from birth up to maturity, and the same care is equally beneficial through life. This is equally true of all of our useful domestic animals.

Toe Crack of Mule.—T. D. Williams, Alachua, Co., Florida, has a mule that has a split in the toe of the fore foot. She goes barefoot in soft hot dry sand, and the inside of the hoof seems to sink from the outside shell, leaving a space. Sometimes the sand gets into the crack and makes her quite lame. At present the toe is broken off above the split. It is a common trouble here of both horses and mules. Have the foot thoroughly cleansed, then gently pare the edges till the blood shines through, but avoid bleeding, then have the blacksmith put a rivet through the shell to draw the separated parts together without too much violence, calk the crack gently with cotton and cover with tar. The hoofs of animals used in such a soil and such condition should have the feet frequently washed and greased. The foot treated as advised should be washed as often as any sand reaches the cleft toe. Probably a light shoe on the fore feet would be of great service in preventing too much wear otherwise.

Caked Milk Glands of Sow.—Joseph Ainsworth, Logan Co., Idaho, has a sow that has pigs two weeks old, which has hard lumps in the teats and sores on the milk glands. He has given salts, greased the glands and bathed with carbolized lotion. We advise the bathing with hot water and the continuance of the treatment. The cow consulted about has perfectly recovered.

Scaly Leg. — Mrs. C. V. Lanhan, Kittitar Co., Wash.: The chickens' feet and legs which are covered with a "horny growth" are suffering from scaly leg, a disease caused by a parasite. Soak the legs in kerosene oil for ten minutes, then anoint with sulphur and lard, one part of the former to two parts of the latter mixed; do this every other day for three times, then wash the legs in soap and water, removing the growth, and anoint once with clean lard. Kerosene alone will do the work, but the above treatment is preferable.

Lymphatic Gland of Neck.—Sidney H. Gregg, San Diego Co., Cal., has a young mare that had a swelling between the muscles of the neck. It was at first hard, becoming soft, then fluctuating. When opened a watery fluid escaped tinged with blood. This requires an attentive treatment. A ball containing a scruple of aloes and a scruple of calomel, three times at night; then a small ball every night containing two grains of zodide of arsenic for a week. Then omit for two or three days and repeat the same plan of treatment. Grass should be given, also carrots in season. A local application of tincture of iodine three times a week should also be made. When the tumor is open inject into it the tincture of iodine once a week. To make a ball, mix the ingredients for a dose in linseed meal with molasses, just enough to fill a gelatine capsule. These capsules can be procured at drug stores, are convenient, and secure the administration of the whole of the medicines.

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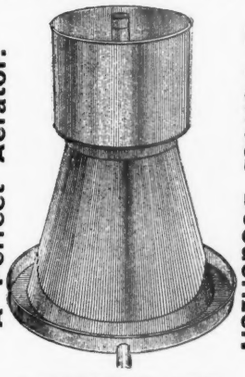

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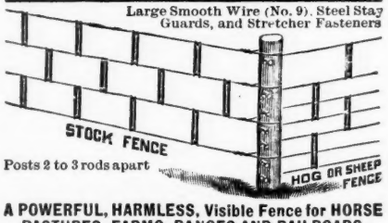

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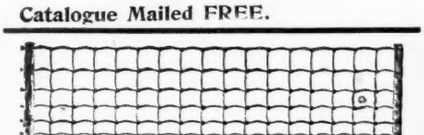

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MATTERS OF BUSINESS.

(*Continued from Page* 390.)

the crops of 1889. The plus mark indicates that the Department estimate is so much in excess of the census, while the minus sign indicates a Department return of so much under the census:

DEPARTMENT AND CENSUS COMPARED.

	Discrepancy in Area.		*Discrepancy in Yield.*	
WHEAT.	*Amt.*	*Pr ct.*	*Amt.*	*Pr ct.*
Illinois	+139,002	0.6	+642,919	0.2
Indiana	+230,786	0.9	+3,868,262	10.0
Iowa	+1,019,290	108.0	+12,873,213	158.0
Nebraska	+705,164	88.0	+6,276,941	59.0
Kansas	+97,365	0.6	+512,129	0.2
Total	+3,092,607	40.0	+24,193,404	20.0
CORN.				
Illinois	+161,537	0.2	−30,504,695	11.0
Indiana	+91,618	0.3	−2,187,094	0.2
Iowa	+1,274,376	16.0	+36,835,218	12.0
Nebraska	−1,383,212	25.0	−66,352,996	31.0
Kansas	−501,574	0.7	−19,066,568	0.7
Total	−357,195	0.1	−81,276,145	0.7
OATS.				
Illinois	+27,483	0.1	+7,761,196	0.6
Indiana	−133,991	12.0	−4,174,661	13.0
Iowa	−1,012,210	26.0	−47,220,289	32.0
Nebraska	−419,887	21.0	−13,880,640	32.0
Kansas	−46,348	0.3	−7,109,034	16.0
Total	−1,583,753	14.0	−54,614,428	14.0

Condition of Wheat and Other Crops.

The statistical returns of the Department of Agriculture for May give an average condition of 84 per cent. for wheat, against 81.2 on April 1st, as compared with 97.9 in May, and 96.9 in April of 1891. Notwithstanding the general improvement in the crops, the weather has been too cold for rapid growth. In Michigan the April weather was very severe, causing considerable "heaving" in clay soils, that nearly offset the improvement in other areas. Low temperature prevented much improvement in Missouri. Condition is still good on the Pacific coast, though slightly lower in California. A comparison of the condition in the six central wheat region States for the months of April and May, this and four previous years, is as follows:

	1892.		1891.		1890.		1889.		1888.	
	A.	*M.*	*A.*	*M.*	*A.*	*M.*	*A.*	*M.*	*A.*	*M.*
Illinois	82	86	97	99	75	64	97	98	74	57
Indiana	78	85	99	99	75	63	94	95	75	59
Kansas	77	80	99	99	87	92	96	98	97	94
Michigan	83	84	93	99	67	73	87	92	76	64
Missouri	72	74	96	99	83	82	95	98	82	80
Ohio	71	75	98	97	87	82	88	90	68	56
Average	77.1	80.4	97	98.4	79	76	92 5	95.1	78.4	68.2
U. S.	81.2	84	96.9	97.9	81	80	94	96	82	73.1

This shows that the May condition for this year in the States named improved 3.3 per cent. over April, as compared with an improvement of 1.4 per cent. a year ago, and that their May average condition was 18 per cent. less than a year ago, and 14.7 per cent. less than in May, 1889, but 4.4 per cent. higher than 1890, and 12.2 per cent. above the 1888 average for May.

The condition of rye has advanced from 87 per cent. in April to 88.9 per cent. in May, as compared with 97.2 per cent. in May, 1891, and 93.5 per cent. in 1890. Winter barley averages 92.8 per cent., as compared with 96.2 per cent. in 1891, and 84.6 per cent. in 1890. The percentage of New York is 92, California 94, Illinois 90, and Michigan 88. Mowing lands suffered somewhat from winter freezing, but average 89.6, while the condition of pastures averages 87.5, as compared with 97 per cent. a year ago.

The proportion of spring plowing done on May 1st was 76.6 per cent. The present season has been cold and unfavorable, with only 64.6 per cent. of spring work actually performed. Work is more advanced than usual in the Eastern States, where the temperature has been high. From Pennsylvania to Virginia there was an excess of rainfall, with low temperature, hindering spring work. In the Central West about normal preciptation, with some deficiency of heat, delayed farming operations, which are not as well advanced as usual. The Pacific coast has been comparatively cool, and spring plowing was backward. Altogether, the spring may be considered late, and farm work crowded into narrower limits. Yet it must be remembered that just a year ago, with its enormous crops, the season was backward, with only 68.8 per cent. of spring plowing done on May 1st, whereas the average for a series of years is 77 per per cent., as against 76.6 per cent. this year. The backwardness of the present season should hardly be taken as showing any shortage of crops. But

(*Continued on Page* 395.)

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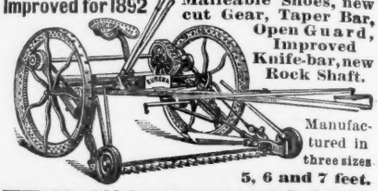

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MATTERS OF BUSINESS.

(*Continued from Page* 394.)

the abnormal rainfall from May 1st to 15th, over a large area in the Missouri and Mississippi valleys, has apparently done considerable injury to wheat, and delayed farm work, besides doing enormous damage to bridges and to property on low lands.

Cotton Acreage and Planting Prospects.

The May report of the Department of Agriculture shows a delay in cotton planting owing to low temperature, drouth in some districts and excess of rain in others. Germination was arrested, plants started slowly and some replanting will be necessary. The proportion of the prospective total area to be put in cotton that was planted up to May 1, in the several States, this and the five preceding years, was as follows:

States.	1892.	1891.	1890.	1889.	1888.	1887.
Alabama	83	80	85	87	83	88
Arkansas.....	64	76	60	86	77	80
Florida	90	92	87	94	95	96
Georgia.....	85	80	86	87	85	84
Louisiana	72	78	70	89	78	83
Mississippi.....	78	77	65	88	80	84
North Carolina	70	63	77	74	71	70
South Carolina	83	78	86	86	84	80
Tennessee	45	71	57	84	76	80
Texas	83	79	75	90	76	82
Average	78.3	77.5	75.8	87	79.9	82.4

The foregoing table shows that in the leading cotton States, exclusive of Tennessee, Virginia and other sections of minor importance, 78 per cent. of the area which it is proposed to have in cotton this year had been planted up to May 1st. This proportion is about two per cent. less than was in the ground at the same time last year, compared with 81.3 by the May 1st average for five years, and 78.5 for ten years This hardly bears out the Department's claim that "planting is materially later than usual."

Regarding the area under cultivation the report says: "It is difficult to forecast a result that was partially in the future, and the averages are given only to show what was the intention of planters. The decrease in area, as indicated, averages 18.6 per cent. the total plantings being: Virginia 72 per cent. of the area in cotton last year, North Carolina 70, South Carolina 80, Georgia 83, Florida 80, Alabama 85, Mississippi 83, Louisiana 82, Texas 82, Arkansas 80, Tennessee 74, Missouri 74. Every year the area is reported too low and less than the year before, yet, notwithstanding this fact, there has been an increase in area of more than half a million acres per annum. If we apply to the official figures of the Federal Census for 1889, the percentage of increase or decrease of area in 1890 and 1891 estimated by the Department of Agriculture, and carrying out also the indicated reduction this year as shown by the preliminary reports (dated May 1st) as to prospective acreage, the following is arrived at:

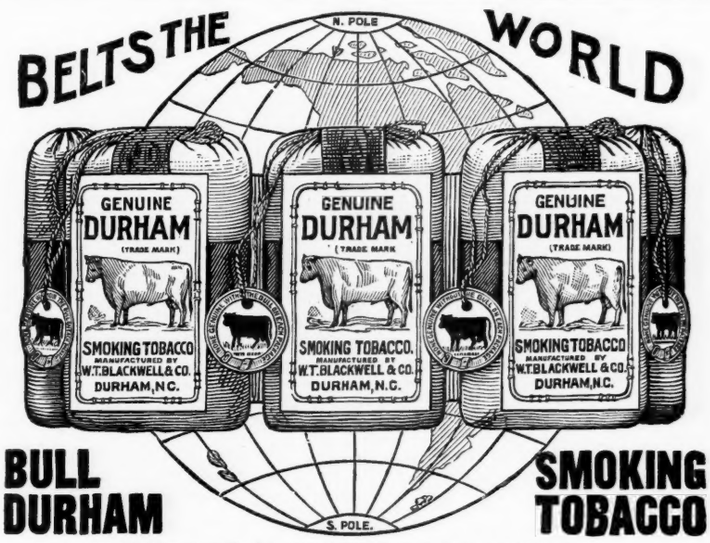
COTTON ACREAGE BASED ON CENSUS.

[In thousands of acres, last 000's omitted.]

Acres.	1889.	1890.	1891.	1792.
North Carolina	1,147	1,170	1,123	786
South Carolina	1,988	2,047	1,965	1,572
Georgia	3,346	3,412	3,242	2,691
Florida.....	227	234	232	185
Tennessee.....	745	745	708	595
Arkansas.....	1,701	1,684	1,616	1,293
Alabama.....	2,762	2,756	2,811	2,389
Mississippi.....	2,883	2,940	2,999	2,489
Louisiana.....	1,271	1,207	1,159	950
*Texas, etc.....	3,497	3,323	3,497	2,868
Total	19,50.	19,518	19,352	15,818

*The statistics of the 1889 crop for Texas and the minor cotton-producing States are now undergoing review in the Census office, the figures used being preliminary and not verified as have been the Census reports for the other States printed above.

Should the fact prove to be that this year anything like three million less acres are planted to cotton than last year, the market will advance as fast as the truth becomes established. It would mean a decrease in product of nearer two million than one million bales—enough to make supply a trifle short of demand, and result in a healthy improvement for the market at home and abroad. The tendency is already upward, prices show some advance, and the downward movement is more than checked. Exports continue liberal, and while exports to the United Kingdom still show a decrease, other European countries are increasing their direct purchases, notably France, Germany and Russia. Exports were only 11,600,000 pounds less, from September 1st to May 1st, than during the corresponding period of the 1890-91 crop year.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Legal Protection Against Patent Suits.

During the past 15 years, since the troubles growing out of the "Drive Well" patent, many efforts have been made to so amend the patent law, as to protect innocent purchasers of a patented article for their own use, from suits or threats of suit for such use of a patented article. But the bills were so drawn as to practically destroy the entire patent system which has done so much for the country, and none have passed Congress.

At the patent centennial held at Washington last year, an association was formed, composed of persons in all branches — farmers and others — which appointed a committee on legislation. This committee, recognizing the fact that abuses do exist under the law, by sharpers or speculators going about demanding pay for what they assert is an infringement of some patent, and threatening suit in case they are not paid, and, by such threats, often, without any good ground for such claim, collecting of farmers and others from $10 to $25, have submitted to the Committee on Patents of the House of Representatives an amendment which will stop all such abuses.

It simply provides that hereafter, when a patent is alleged to be infringed, the patentee, or his representative shall seek his remedy in the first instance by suit against the manufacturer or vendor of the article alleged to infringe, and shall not sue the individual user who may have purchased such article of a regular dealer in the open market for his own use, until he shall have first enforced his remedy against the manufacturer or dealer; provided the purchaser shall inform the patentee, or his representative, at the latter's request, from whom he purchased the article. This exemption from suit, however, is not to apply to any corporation, firm, or company; because, if it did, a railroad company, for instance, could arrange with some irresponsible party to make the articles for it, and then the company could use them with impunity. So, too, it does not apply to any corporation, or party, who shall use a patented machine or process, for the manufacture of articles or products for sale. The reason for this is, that there are many branches in which a few companies, with a comparatively small number of machines, can do the business for the whole country, and it obviously would not be right to let them use without liability.

Road Improvement in the West.

A State Road Improvement Convention will be held at Chillicothe, Ohio, on August 16th and three following days. Besides discussions on the ways and means of improving country roads, there will be an exhibit of road-working machinery and appliances and of sections of model roads. Reduced hotel and railroad rates will be secured, so that expenses may be light, as well as having the occasion both pleasurable and profitable.

It is also proposed to have a comprehensive exhibit of improved roads and road machinery in the Columbian Exposition at Chicago next year. Farmers throughout the country are now fully aroused to the necessity for good roads, appreciating at length the immense loss of time and money which they have for so long incurred under the old system of leaving the roads practically to take care of themselves, realizing that a few dollars spent in patchwork is but money thrown away.

In Missouri this interest is most marked, under the leadership of the State Board of Agriculture. In Pettis county the farmers have petitioned that the county be bonded to the amount of $100,000 for the purpose of building roads. In Scott county a subscription has been set apart to grade and gravel the county road. In Jasper county half the saloon license tax is to be expended upon the main traveled roads of the county. In Callaway the citizens of one town, Fulton, have promised to raise $600 per mile to build twelve miles of gravel road. In Ray county thirteen farmers have subscribed $3,000 toward having a good road. In Davies' county the farmers are holding meetings and organizing at their different school houses to devise plans for improving their roads, and so the list goes on throughout the State.

The Situation in Russia.—The picture of the Russian famine drawn by Hon. Charles Emory Smith, the American Minister at St. Petersburg, in the May issue of the *North American Review*, only serves to corroborate preceding reports, and to impress upon Americans the awful destitution which still prevails there, and will continue to prevail for months to come. In the province of Samara, which may be taken as typical of those in the famine district, there are 964,500 sufferers, whose food allowance from the district councils averages 198 pounds *per capita* for an average of eight months. The quantity ordinarily consumed *per capita* in that time is 348 pounds. In addition to these people, there are 400,000 other sufferers who, by the rule of distribution, are left to the mercies of private charity for their daily food, and fare worse than the 964,000. The rule excludes peasants between the ages of 18 and 55 capable of work, and children under 10 years of age, who must share their parents' allowance.

Before March 1st the Russian government had appropriated 150,000,000 rubles, or $75,000,000, and the direct outlay before June can hardly be less than 200,000,000 rubles. Besides this, taxes have been remitted, and work has been furnished where practicable. Large public works, employing hundreds of thousands of men, have been undertaken. The forests of the imperial domain have been opened to the peasants for fuel. The direct appropriations of the government to the zemstvos or district councils are nominally loans, but, as the councils were in debt previous to the famine, and a sweeping destruction of live and other stock has accompanied the great calamity, the enormous sum may doubtless be treated as a gift. A Russian peasant can sustain life for a month on 70 cents' worth of food, hence the cost of supporting the million sufferers in Samara alone, seven months, will be seven millions of dollars, without counting 400,000 more who are not included in the distribution.

The appeal to private philanthropy has brought out noble examples of generosity and devotion among the proprietary class. A single family has taken care of 20,000 people; women of gentle birth have braved hardship and disease to feed the hungry and minister to the sick. The Emperor has directed the relief work with vigor, and given from his private purse. The three shiploads of breadstuffs from the people of the United States have made a deep impression in Russia, even to the remote interior. America's gifts, all told, will aggregate half a million dollars in value, enough to support 700,000 people a month.

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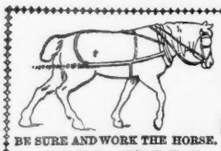

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Water will run from it pure and clean. It covers double the surface of any other paint, and will *last four or five times longer.* Equally useful for any iron work. Send for circulars. JOS. DIXON CRUCIBLE CO., Jersey City, N.J.

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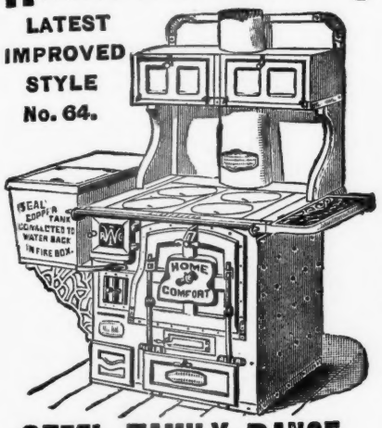

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Curling Fluid.

Keeps the hair in curl for days Innocent as cologne. A toilet necessity. Not sent on trial.
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THE GREAT TEMPERANCE DRINK

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Transportation by American Vessels.

The importance of American shipping as an industry is but little known, and still less appreciated. Statistics compiled by the census bureau show that, in 1890, there were 25,540 steamers, sailing vessels and unrigged craft flying the American flag. Their gross tonnage was 7,634,000 tons, and their value $215,069,000. The freight movement during a single year, 1889, was 172,110,000 tons of all commodities. Excluding the pleasure craft on the Atlantic coast and the Gulf of Mexico, the number of persons employed on American vessels was 106,436, and the total amount of wages paid them was no less than $36,867,000. An interesting comparison is here shown of the numbers and different kinds of vessels, with their value, according to geographical location:

	Stm-'rs.	*Sail. Ves.*	*Un-rig'd.*	*To-tals.*	*Value.*
Atlantic Coast.	2,713	6,490	3,250	12,453	$123,874,177
Gulf of Mexico	220	613	175	1,008	3,851,270
Pacific Coast ..	531	822	489	1,842	23,067,370
Great Lakes...	1,489	987	308	2,784	48,941,474
Miss. Valley ...	1,114	.....	6,339	7,453	15,335,005
Totals.....	6,067	8,912	10,561	25,540	215,069,296

What will, no doubt, surprise many readers of the AMERICAN AGRICULTURIST is that the total number of vessels on the Great Lakes and Mississippi Valley is only 2,000 less than those on the whole Atlantic coast, while it is more than three times as large as the combined totals of American vessels on the Gulf of Mexico and Pacific coast. The number of steamers on the lakes and valley is within 110 of the number of steamers plying off the whole Atlantic coast, though their value is but little more than one-half, owing to the more costly construction necessary to enable steamers to withstand ocean voyages, and to fit them for the transportation of passengers. We next give an equally interesting comparison of the quantity of freight carried at each location, together with the number of employes and their wages:

	Freight in tons.	*Number of Emp.*	*Amt. of wages paid.*
Atlantic Coast.....	77,597,662	*a* 54,859	$*a*18,862,199
Gulf of Mexico....	2,864,856	*a* 3,891	*a* 1,215,744
Pacific Coast.....	8,818,363	15,809	6,127,701
Great Lakes.....	53,424,432	15,881	5,322,799
Mississippi Valley	29,405,046	15,996	5,338,862
Totals	172,110,423	*a*106,436	$*a*36, 867,305

a. Excluding pleasure craft on the Atlantic coast and Gulf of Mexico.

Here, again, we find some remarkable facts. There was actually more freight, by 5,000,000 tons, carried on the Great Lakes and Mississippi valley vessels than on all the Atlantic coast vessels. Not only this, but the number of employes in the former was only 31,877, with wages of $10,661,661, as against 54,859 on the latter, with wages of $18,862,199. The larger number of hands on the Atlantic is in a measure due to passenger steamers and their consequent army of stewards, cooks, pantry men, and waiters. But, coming right down to economical administration and business management, we find that on the lakes and valley vessels there is only one man employed to every 2,600 tons of freight transported, and that it is handled at a cost in wages of only 13 cents per ton. But on the Atlantic vessels the cost in wages is over 24 cents per ton, while there is one man employed to every 1,413 tons of freight, showing that the gulf and valley lines effect a saving of 11 cents per ton in handling their freight, and that each man handles annually 1,200 tons more, as compared with the Atlantic vessels, although this may be offset in a measure by the larger number of shore hands employed in our local waters.

A Wool Retrospect.—A very comprehensive presentation of the statistics of sheep and wool by the United States Department of Agriculture in its May report, shows that the value of our flocks is greater by $42.000,000 than in 1870, and the value per head greater than since 1875. From these facts it appears that the domestic supply of wool is six times as great as in 1840, and that both domestic and foreign supplies were only three pounds to each inhabitant, while they are now six and a half pounds. Then, including imports of woolens, scarcely four pounds per head were used, whereas we now require over eight pounds. It appears that three-fifths of all the wool used for all purposes is of domestic production, while four-fifths of the requirement is manufactured in this country, leaving only one-fifth to come in the shape of imported goods. For three decades the value per head of imports of woolens has been regularly declining, and is now only about three-fourths of a dollar per annum for each individual, when in 1850-1860 it was considerably more than a dollar.

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DR. JUDD'S
A BATTERY AND BELT COMBINED AND PRODUCES SUFFICIENT ELECTRICITY TO PRODUCE A SHOCK.
ELECTRIC BELT
ELECTRIC TRUSSES, BOX BATTERIES. ELECTRICITY WILL CURE YOU AND KEEP YOU IN HEALTH.
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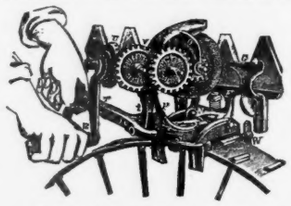
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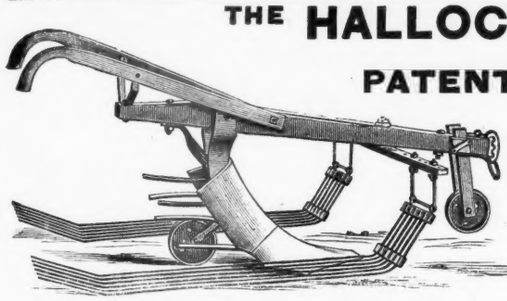

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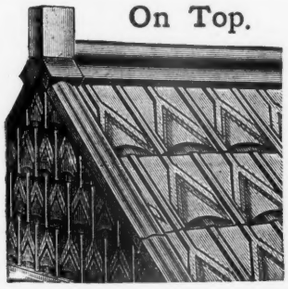

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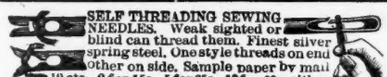

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RECORD OF SCIENTIFIC PROGRESS FOR THE YEAR 1891. By Robert Grimshaw, M. E., Ph. D. New York: Cassell Publishing Co.

The world's advance in useful knowledge becomes greater with every year. Though the unknown is vast, the known, compared with itself, rapidly enlarges. A man must read much to be on time with the improvements, in even his special line of work. Much of the reading proves unimportant, useless to remember, though necessary to read. The scanty reading in other lines is not sufficient for judgment of what is useful. To serve those who wish to keep reasonably well informed on the whole range of scientific progress the author has prepared this volume, which contains a condensed statement of the important advances in all occupations. By means of this book one can keep abreast of the world's progress in material things. Sold by the Orange Judd Co. Price $1.50.

THE PRACTICAL FRUIT GROWER. By S. T. Maynard, Professor of Botany and Horticulture, at the Massachusetts Agricultural College. Illustrated. Cloth, 16mo., pp. 128. Springfield, Mass.: The Phelps Publishing Co.

The fruit grower will find in this handy volume just what he is looking for and no more. The various fruits, how we got them, where they grow, what and when and how to plant, how to graft and bud and propagate, diseases and remedies, when to gather fruit, how to store, how to pack and ship and sell—just what the beginner needs and the successful fruitman practices — are explained in this well arranged book. Sold by the Orange Judd Co. Price, postpaid, 50 cents.

A BABY'S REQUIREMENTS. By Elizabeth Robinson Scovil, Superintendent of Newport Hospital, R. I.; 16mo., Leatherette, pp. 55. Philadelphia: Curtis Publishing Co.

This dainty volume combines old-fashioned common sense with the most approved medical knowledge. What to have ready when baby comes is fully described, with directions for making or buying a baby's wardrobe. How to nurse, and feed, and wean; the bath, the basket, the bed, and the common ailments, are told by a woman who

(*Continued to Page* 401.)

A Generous Proposition.—Wells, Richardson & Co., the enterprising manufacturers, of Burlington, Vt., write us under date of Jan. 15 as follows:

Editor AMERICAN AGRICULTURIST: We are very anxious to have the gold medal for the best butter at the Chicago World's Fair go to some United States butter maker. At the Paris Exposition, Moulton Bros., of Randolph, Vt., received the gold medal, and the color used in their butter was our Improved Butter Color. We will give enough of this color for sixty pounds of butter to any of your readers who will send us six cents in stamps. We will also send our valuable Dairyman's Account Book. The best materials are necessary for making the best butter.

Very truly yours,
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Every Mother Should have JOHNSON'S ANODYNE LINIMENT in the house for Croup, Colds, Sore Throat, Catarrh, Tonsilitis, Colic, Nervous Headache, Cuts, Bruises, Cramps, Pains. Relieves Summer Complaints like magic. Sold everywhere. Price 35 cents, 6 bottles, $2.00. Express paid. Pamphlet free. I. S. JOHNSON & CO., Boston, Mass.

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BEST! EGGS! FREE! From 10 most profitable varieties PURE BRED POULTRY. Money refunded on every 5th order received. $2.00 per SETTING. Send or catalogue. S. W. GUTHRIE, Indiana, Pa.

I GAMES, 13 E $2.00. Red Caps, B Minorcas, G & S Wyandottes, W & B P Rocks, 15 E $1.00. 10 Bronze Turkey Eggs $2.00. Circular free. A. LEIDA, Delaware, N. J.

JOHN W. TERRETT, Alexandria, Va.—White Leghorns exclusively; best egg producers in the world; eggs $2.00 per 13.

THOSE ANSWERING AN ADVERTISEMENT WILL CONFER A FAVOR UPON THE ADVERTISER AND THE PUBLISHERS BY STATING THAT THEY SAW THE ADVERTISEMENT IN THE AMERICAN AGRICULTURIST.

OUR LIBRARY CORNER.

(*Continued From Page* 400.)

has taken care of babies, and not by a would-be reformer, with some theory dearer than the child and its mother. The chapter on the mother's comfort is worth far more to the young mother than many of the large books so frequently advertised. In fact, to any mother who cares for her own and her baby's welfare, this little book is worth many times its weight in gold. Sold by the Orange Judd Co. Price 25 cents postpaid.

THE PHOSPHATES OF AMERICA: Where and How they Occur, How they are Mined and What they Cost; with practical treatises on the manufacture of sulphuric acid, acid phosphate, phosphoric acid and concentrated superphosphates, and selected methods of chemical analyses. By Francis Wyatt. New York: The Scientific Publishing Co.

This is a book of 184 large pages, designed for the use of specialists in fertilizers, mining and manufacture. The farmer will find much of interest in it, and the book is indispensable for every agricultural college, student and experimenter. It estimates the output of rock phosphate in the United States, for 1891, at 650,000 tons, valued at several million dollars. The book is especially valuable for the complete insight it gives into the phosphate deposits of Florida. Numerous illustrations are given of phosphate mining in Canada, South Carolina and Florida. The rest of the work illustrates and describes methods of fertilizer manufacture on a large scale. It has a good index. Sold by the Orange Judd Co.; price $4.00.

An Old Fraud in a New Guise.

An old confidence game has recently been worked in Rhode Island by three adventurers. One drives about the country pretending to be a representative of the AMERICAN AGRICULTURIST, and inquiring about the price of lands. The second member of the gang turns up a day or two later saying that No. 1 recommended him to go to the farm and look it over as a desirable investment, as he has a large sum to invest and regards improved farm property as the best place for his money. While he is talking with his intended victim, the farmer, adventurer No. 3 appears on the scene and asks the directions to the next town. This leads to conversation, in the course of which No. 3 displays several large packages of what is apparently good money, and speaks of a game which he proceeds to describe. This is a species of three-card monte, in which No. 2 engages suspiciously until he is allowed by No. 3 to win several small stakes, when the stakes are increased and efforts are made to induce the farmer to join in the game. If he does, he is certain to lose his money or to be robbed. Any one who tells such a story as this while claiming to represent the AMERICAN AGRICULTURIST may be reckoned a downright fraud.

Corns of the Horse.—James Whettle, Providence Co., R. I.: The corn described is what is termed a new corn. It consists of exuded blood effused into the soft horn, and is of a bright scarlet color from inflammation. It should be pared out with great care so as not to do any injury to the crust or bone. Then have a three-quarter shoe, one so narrow in the web at the heel so that it may only rest on the crust. Corns are so commonly the cause of lameness in road horses, that a brief statement may prove of value to many owners. Corns are bruises of the sole of the foot, usually occurring in the angle formed by the bone and crust in front of the heel. They are seldom found on the hind feet. They are in the horse what a blood blister is to man, and result from the same cause, a bruise. Though blacksmiths file away the crust, and put on badly fitting shoes, yet these useful artisans do not, with all their faults, cause one corn in ten. A good horseshoer is a man of a truly humane art. The bone should never be cut away by a blacksmith, and a veterinarian will not do it but from the necessity to remove disease. Where there is active inflammation after the paring out is done, the foot should be set into a linseed meal poultice till the inflammation subsides.

Excelsior.—There is no better paper than the AMERICAN AGRICULTURIST. It is Excelsior. We cannot do without it.
JOSEPH AINSWORTH, Logan Co., Idaho.

Milk Men and Milk Maids

must have their tin cans, tin pans, and everything else faultlessly clean, and there is nothing half so good for such cleaning as

Gold Dust Washing Powder.

Housekeepers too have much to clean, and they can't afford to do without GOLD DUST WASHING POWDER, which makes things clean in half the time, and keeps them clean for half the money.

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Hardware Men Keep It. Give name of this paper. 531 Wood St., Pittsburgh, Pa.

$20 Phosphate for Wheat.
Sold to farmers direct. No agents.
YORK CHEMICAL WORKS, YORK, PA.

When writing to advertisers be sure to mention the AMERICAN AGRICULTURIST.

NOTES OF THE SEASON.

Spring Floods and Weather.

Last year's May report showed a delay of one to two weeks in cotton planting, especially in North Carolina and Tennessee, and fully one-third of the area had to be seeded north of the Gulf States after May 1st. The delay was due to the excessive rainfall in February and March, whereas this year there has been excessive rain during the early part of May accompanied by heavy floods throughout a large area of the cotton growing district, rendering re-planting necessary, and to a measure decreasing the area that already had been planted, and proportionately the crop prospects. Along the Missouri valley, farm work has been affected by excessive rains, which, mixed with snow, were prevalent from the middle of April till well into May. Early sown oats and potatoes have rotted in the ground. Not over 25 per cent. of the corn crop had been planted by May 10th, the ground being too wet and cold, and heat and sunshine were imperative in order to secure anything like a prosperous season throughout this vast region. The cotton area in Missouri is reduced one-third, and only one-sixth was planted. Oats were mudded in and the crop will be curtailed, while millet grows in favor. From the Northwest the reports are more numerous and emphatic in regard to the bad condition of spring wheat seed, which is rotting in the ground in some sections, while the Red River valley reports only one-quarter as much land seeded to wheat up to May 15th as a year ago.

Agricultural, Personal, and Commercial.

The Price Not Half Enough.—I am bound to give you a thousand thanks for the AMERICAN AGRICULTURIST and the Peerless Atlas. The price you ask for it is not half enough.

OTTO KLUEVER, Cuyahoga Co., Ohio.

Harvesting Machinery.—The catalogue of Aultman, Miller & Co., Akron, Ohio, is a neat and interesting pamphlet describing and illustrating the famous Buckeye Harvesting Machines favorably known in every civilized country in the world.

Bees.—Send your name for for free samples of bee veils, comb foundation, advice to beginners, and circulars of bee book, smokers, etc., or send eight one-cent stamps for a 24-pamphlet on *Taming and Handling Bees*. Write to Dadant & Son, Hamilton, Ill.

The Champion.—A good idea of the extent of the Champion Harvester Works at Springfield, Ohio, may be obtained by examining the new catalogue of its proprietors, the Warder, Bushnell & Glessner Co. This firm has every facility for manufacturing superior goods, and the excellence of their mowing machines shows that they are taking full advantage of the means at their command.

The India Wheat Crop had rather a poor outlook on May 1st, according to official reports of the Indian government. The season opened unsatisfactorily, with a lack of rain till the end of January and February. The area has been reduced in different districts from two to twenty-five per cent. This ought to reduce the export surplus to 25,000,000 bushels, against 46,000,000 last year.

Crops in Europe needed warmth and rain according to official reports May 1st. England had sudden changes in April temperature, but without serious damage to crops. French crop prospects are good, though wheat looks poor in the North. Germany had a cold, dry April, so did Austria, but without material injury. The Russian outlook is better with more seasonable weather, and damage to wheat appears to have been exaggerated.

Roofing for Farmers.—How to properly roof farm buildings is an important question. Those intending to build or recover a barn would do well to send for the catalogue of the Philip Carey Mfg. Co., 101 to 109 Gilbert Ave., Cincinnati, Ohio, whose advertisement appears on another page of this number. A great point in favor of this roofing is that it is inexpensive and can be applied by any handy man on the farm without the necessity of special tools or mechanical skill.

New Crop Tobacco.—Higher prices for cigar leaf is stimulating an increased acreage in the Connecticut Valley, New York, Pennsylvania, and Florida, but not in Wisconsin, where the '91 crop was inferior in quality, and has sold low. The active market for Burley tobacco, at advancing values, bids fair to increase acreage in Kentucky and other Southern States. Decatur Co., Ga., and some other sections in the South will try growing cigar leaf on an extensive scale.

Bee Keeping in Pennsylvania.—One of the most influential and progressive organizations for bee keeping in the United States is the Philadelphia Bee Keepers Association of which Dr. H. Townsend is President and F. Hahman, Jr., Sec. The association has just celebrated its tenth anniversary, in commemoration of which it has issued a neat little pamphlet giving an account of its progress, condition, and the excellent work it has done in promoting and extending scientific and profitable bee culture throughout the country.

Prosperity of Kansas.—The State of Kansas is again attracting the attention of farmers throughout the country because of its series of successful crops in the past three years. In view of the large movement of agriculturists into that State, the Land Department of the Santa Fe Road is having prepared a new folder descriptive of the resources of the State, with revised maps, reliable statistics and other information. Anyone interested in this can obtain a copy free, by making written application to John J. Byrne, Assistant Passenger Traffic Manager, Atchison, Topeka & Santa Fe R. R., Chicago, Ill.

Horse Powers, Threshing Powers, Etc.—The value of a good horse power on the farm can hardly be overestimated, and the fact that such machines are not found on every farm can only be explained by the fact that comparatively few farmers are aware of the great advantages that may be derived from their use. On many a farm the entire expense of a horse power could be saved in one or two years. The catalogue of A. W. Gray's Sons, Middletown Springs, Vt., gives excellent and true descriptions and illustrations of the various powers, threshers, and wood sawing machines manufactured by them and is well worth a careful examination by every farmer.

Spraying Pumps and Nozzles.—Having devoted considerable space to the theory and practice of spraying as a remedy for insects and fungus enemies, we are glad to draw the attention of our readers to the catalogue of the Deming Co., Salem, O., whose advertisement appears on another page of this number. The Eureka Patent Spray Nozzle made exclusively by this company is simplicity itself. By simply turning the cock handle it can be changed from a solid stream to either a coarse or fine spray. The large variety of pumps, nozzles, pipe extensions, etc., manufactured by this company are fully described and illustrated in their catalogue, which will be sent free to all applicants mentioning the AMERICAN AGRICULTURIST.

Baling Presses.—The number of really first-class baling presses may make it somewhat puzzling for farmers who wish to select one for their own use, but whatever the advantages of certain presses may be, no one can go amiss by selecting a Victor or any of the other Ertel Baling Presses, manufactured by Geo. Ertel & Co., Quincy, Ill. They are giving perfect satisfaction wherever used, doing the work economically and to perfection. So convinced are the manufacturers of the worth of the presses that they are operating the Victor against any other portable horse-power baling press in the market. Their descriptive and illustrated catalogue has just been issued and will be mailed free on application to all readers of the AMERICAN AGRICULTURIST.

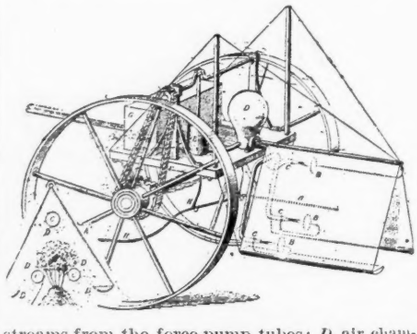
Changes in Crop Area.—The past winter has witnessed but little winter killing of wheat, and there is, therefore, little forced change in the comparative distribution of the principal crops. The late spring, accompanied in many districts by excess of rain, has prevented the seeding of the total acreage intended for oats in portions of the Ohio and Missouri valleys, the breadth thus prepared going largely to corn. The large crop of potatoes gathered last year resulted in quite generally low prices, discouraging growers. As a result the acreage will be somewhat smaller this year in New England, where the breadth will go to corn, both field and sweet; in the States of the central West, where spring crops generally will occupy the area given up, and in the mountain regions (Colorado and Wyoming), where grass and alfalfa will increase at the expense of potatoes.

A Revolution in Cooking.—While in almost every branch of industry the march of improvement has made astonishing progress, still, in the methods of cooking, inventors appear to have accomplished but little It is, therefore, no little satisfaction to be able to notice the advent of a device which does away with a great part of the work in the kitchen, and, at the same time, food cooked in it is more savory, juicy, and better flavored, than if cooked in the old way. It economizes space, as the whole meal can be cooked at once, on a very small stove, or over a single burner if a gas or oil stove is used. It is impossible for anything to burn, and, while cooking, no watching nor stirring is required. All this is accomplished in the Beveridge Automatic Cooker, manufactured by W. E. Beveridge, 9 West 14th street, New York, whose advertisement appears on another page of this number. The illustrated and descriptive circular of this firm gives a full and clear explanation of the many advantages of this cooker, and will be sent free to all applicants mentioning the AMERICAN AGRICULTURIST.

Irrigation in Oregon.—Census Bulletin 178 shows that in Oregon there are 3,150 farms that are irrigated out of 10,513 farms in the 16 counties in which irrigation is practiced and 25,885 in the entire State. The total area of land upon which crops were raised by irrigation in the census year ending May 31, 1890, was 176,944 acres in addition to which there were approximately 72,000 acres irrigated for grazing purposes. The average size of the irrigated farms or, more strictly, of irrigated portions of farms on which crops were raised is 56 acres. The average first cost of water right is $4.64 per acre, and the average cost of preparing the soil for cultivation, including the purchase price of the land, is $13.84 per acre. The average present value of the irrigated land of the State, including buildings, etc., is reported as $57.00 per acre, showing an apparent profit, less cost of buildings, of $38.52 per acre. The average annual cost of water is $0.91 per acre, which, deducted from the average annual value of products per acre, leaves an average annual return of $12.96 per acre.

How Speculation Affects the Market.—A prominent New York merchant and speculator writes to the Cincinnati *Price Current*, which is the organ of the Boards of Trade and the Exchanges, strongly condemning the methods of speculation in produce practiced in Chicago and New York. He says that nineteen-twentieths of all the commission houses in Chicago are bears and are speculators short of the market, who try in every way to depress it by all kinds of false rumors. "Every fact or item of news destined to advance prices is permitted to have no effect until the speculators accomplish their end, but all the bearish news is magnified and made the most of. This is why outsiders will not enter the market for legitimate speculation, as they will not buy to be sacrificed by manipulators who appear to have the power to put the price where they like, without regard to the demand from Europe, or prospects of crops at home and abroad. For the same reason foreign buyers hold off, and their markets are affected by ours. They would rather pay more money on a rising market than a less price on a falling one. It has been generally conceded that Chicago speculators rule the grain markets of the world, but lately they have been ruled by one man, Pardridge, With the assistance of an equally bold speculator in New York, Pardridge has for months controlled the market, and on several occasions broken the price from three to five cents per bushel, at times when every condition pointed clearly in the opposite direction and prices should have been advanced. Their daily course has also been to break the market just a few minutes before the close of the day's business, in order to affect the tone of the cables for the following day. To accomplish this object the quantity of wheat sold in New York would be small, as one set of brokers were employed to buy in what another set sold." It is to stop this nefarious practice on the part of men who simply bet on the market and never own or handle actual grain, that the anti-option bill is framed.

A Potato Spraying Machine is figured in the Mark Lane *Express* that may suggest ideas to American inventors and manufacturers. It is so generally necessary to spray potatoes with the Bordeaux mixture and some poison added, so as to both prevent blight and kill bugs, that a machine to do several rows at a time is needed. It should also be adapted for similar use on tomatoes and other crops. The larger cut outlines the machine: *A*, hood for passing over rows of potatoes to confine the mist-like spray, and thereby prevent waste of the mixture; *B B B*, discs for arresting the forced, sharp streams, and dispelling them as mist; *C C C*, nozzles for discharging the



streams from the force-pump tubes; *D*, air chamber for causing the streams to be uniform or constant, and not fitful; *E*, pump; *F*, chain for driving pump; *G*, reservoir or tank for carrying a supply of the mixture; *H H H*, separator and elevator, in the form of a suspended curved steel rod or saline of wood, for dividing and raising fallen stems to an erect position, and guiding them through the hood over or clear of the lower discs. The small figure in the left hand corner is a section of the hood; *B B*, troughs for catching in the hood the spray condensed there, which would otherwise fly to waste; *C C C*, the spray-producing discs; *D D D*, the spray or mist as generated, and showing that about one-fifth of the mixture is utilized by impinging on the potato leaves and stems, and that four-fifths strike the hood for condensation and recovery.

Running Over With Valuable Information.—We receive many papers at our home, but my wife and I like the AMERICAN AGRICULTURIST better than any other. It is always full of interest and running over with valuable information.

M. CALENDO, Humbolt Co., Cal.

Water for the Arid Region.

The United States exercises no control over the waters of the streams in the arid region. Each State and Territory grants the waters of the streams to its citizens. The general government, in giving title to the desert lands, requires, as one of the conditions, that the party making proof of the reclamation of the same shall have a title to the water from the State or Territory in which the land is situated.

Congress has already recognized the absolute and unconditional ownership by Colorado and Wyoming of the waters within their borders. The State Constitution of Wyoming, as ratified by Congress, contains this provision: "The waters of all natural streams, springs, lakes, or other collections of still water within the State, are hereby declared to be the property of the State." It has passed beyond the power of Congress, therefore, to either add to, or take away from, the jurisdiction now possessed by these States. If controversies should arise, the tribunal for their settlement would be the United States Court. The question, therefore, as to the control of the water supply is not in any way connected with the movement to cede the arid land to the States upon proof of its being made possible to farm it by means of irrigation canals.

The greatest possible extension of the irrigated area cannot in any way injure the neighboring States. To save hundreds of miles of costly freight, vegetables and fruits would mostly be raised, and, thus, living expenses would be so lowered that the rich oil wells, and the many mines of coal and iron could be developed. Not only would coal and iron and oil be furnished cheaper to the farmers of the Mississippi Valley, but a great market would be opened for their staple products.

The protection and preservation of the timber on the mountains, the construction of reservoirs to store the flood waters, the distribution of the waters of the streams over the irrigable lands along their banks, will serve to restain and hold back the flood waters which would otherwise run to waste, but which, if used in this manner, will be, in a large measure, restored to the streams in midsummer, to supply the lands below during the time of least supply and greatest need. Thus the most important stream for irrigation in Nebraska is the North Platte river. It is the only stream of any importance flowing out of Wyoming into that State. During May and June its discharge is sufficient to irrigate more than one million acres of land, or more than double the area which can be irrigated by it in Wyoming. Practically, the whole of this now runs to waste. If the portion which it is possible for Wyoming to use was diverted, it would greatly diminish the flood volume, but the waters thus diverted in the early spring would in a large measure be returned to augment the river later in the year. Instead of destroying irrigation in Nebraska, its extension will be aided by equalizing the discharge of the stream. There will be less danger from floods in the spring, and less likelihood of a scanty supply in autumn. So well are these facts understood by those familiar with the situation that, at the irrigation convention held last September in Utah, the delegates from Nebraska voted unanimously in favor of the proposition to cede the lands to the States.

It should be borne in mind that our present land laws were framed to meet the requirements of rainfall regions. They must necessarily, therefore, be more or less unsuited to the conditions of a rainless desert, where the land is worthless unless near an irrigation canal, bringing water from a distant mountain stream. Water being just as necessary to successful agriculture as land, they should both be under one authority. Under the present system, the farmer in Wyoming derives his title to the land from the United States, while the title to his water comes through the State. The settler has to deal with two sets of officers, and is subjected to unnecessary annoyance and expense.

To secure the most economical use of the waters of our streams and prevent complications and controversies in the division of their waters, the location of the irrigation ditches and canals should be in accordance with some prearranged plan. The United States has done nothing to aid in the preparation of such plans, while its control of the public lands deprives the States of the resources and authority to inaugurate them. The result is that the location of ditches is unavoidably left to the interest or inclination of the individual, and is being monopolized by irrigation companies. It is a haphazard development, wasteful of water, and will, in the future prove very expensive of supervision.

In many of the arid States the pastoral interests are of very great importance. The growing of cattle must, for all time, continue to be one of the chief industries. Vast tracts of good grass are now worthless for grazing, because they lack drinking water for stock. The land system for this region should unite the irrigable lands and the contiguous grazing lands; the grazing lands to furnish the summer and the irrigable land the winter food supply. Under the present land system there is no provision by which the grazing lands can be placed under intelligent management. Being government land, they are used by all, and in many localities the native grasses are being rapidly destroyed by over pasturage. Everywhere they are being injured. The results of this suicidal policy must be felt for years to come, unless there is soon inaugurated some measure of restriction and control. At the present time there is no adequate protection of our forest areas. These are the great natural storehouse of our summer water supply, and on their preservation rests, in a large measure, the development of our agriculture.

The reasons for asking that the management of irrigation be placed in the hands of the States is that it would be impossible for Congress to enact a general law which would meet the widely varying conditions which here prevail. The conditions under which irrigation must be developed in Wyoming are radically different from those of California, as are those of Utah and Arizona. Furthermore, the neglect of the general government to exercise any supervision over the development of irrigation has forced each State to take charge of the subject. The result is that in each there is already a system of administration differing from the others, owing to the modifications growing out of differences in physical conditions and the views and prejudices of the people of the different States. To attempt to set these aside at this time would involve untold and practically unending complications.

The transfer of arid lands to the State should be so restricted that title will only pass to the State upon proof of their being supplied with the necessary water by means of irrigation canals and reservoirs. No absolute franchises should be granted. The State should always own the water, and each citizen should always be able to easily secure his share. The irrigation systems should not be loaded down, as many railroads are, with a small capital stock and a large issue of bonds, crushing the farmer with heavy interest and dividends on watered stock. State control can prevent these frauds. The mineral resources of the Rocky Mountains will not be fully developed until vegetables and fruits can be raised cheaper near the mines. Competition in staple grains and fat stock need not be feared by the more fortunate farmer in the Mississippi Valley. In the humid regions the rain falls on the just and on the unjust, but it must flow to the dweller in the desert through costly canals, from the snow-clad mountains. ELWOOD MEAD, State Engineer, Wyo.

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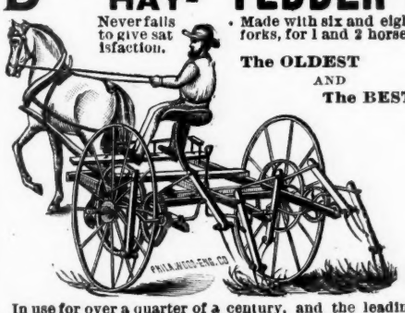

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TO H. H. DEWEESE, ESQ.,
PIQUA, OHIO.

DEAR SIR: When you forwarded your book, "Secrets of Success," to me, by letter of November 26, 1891, you requested that after reading it I would inform you, (according to my opinion and good judgment, of course), as to the practicability of the work. I have read it through attentively and carefully, as it is my habit to read all matters, so I am prepared to give you my opinion as to the practical value of your book for the farmer who wishes to be looked upon as a practical, progressive tiller of the soil. Your book is of such practical value to the wide-awake farmer, that I venture to say, there is no book, as far as I am acquainted with the agricultural books as published in this country, that I would accept in place of yours. It is written in a style at once fascinating and interesting to the reader; but that is not all, it takes the place of a teacher, furnishing plain, practical advice and instruction to the reader who aims to make his vocation a success. I think so much of it that I have given it a place with my favorite selection of agricultural books, which was published in Prussia. They are not a compilation of agricultural clippings taken from newspapers and flying publications, but are the original outpourings of active brains, filled and stored with practical experience and knowledge. It is only such books that have any real merit and are of practical value to the farmer.

Well, I am not a farmer yet; it is but a few years since I took it. Selected an awful piece of wood and swamp land to make a farm out of it; it looks different now though, and if my health and life be spared, I shall yet be a farmer, and have a nice, good farm, too. I am trying and experimenting now as to what I can raise in this northern climate upon my soil to live comfortably and make some money for later days; hence, I send you a small order. I have adopted this course now, because several times heretofore I took the seedsman's glowing catalogue description of grasses, grains, and vegetables, and sent orders on a big scale. I have learned lessons by bitter disappointments. Now, I will first crawl to learn how to run.

Yours respectfully,
J. A. F. SCHEFFELER,
Tawas City, Iosco County, Mich.

P. O. Box 231.
Feb. 10, '92.

TO H. H. DEWEESE,
PIQUA, OHIO.

DEAR SIR: I see in the Agricultural Epitomist your advertisement of your book, "Secrets of Success." I have purchased several books that were praised highly by their advertisers and even recommended by well known writers as being the very best for a farmer to have, for instance: Science in Farming, Farm Chemistry, Success in Farming, etc. I am a farmer and like to learn and be successful; I am considered a close reader, weighing every word and criticising it; but with any of those books, I differ with the author in one way and agree with him in the other. I agree with those authors; the title they gave to their books are excellent, suitable for the farmer and for farming, and they understood how they for themselves made farming profitable by writing their books. I differ with them in this: That their books, after being written, printed, embellished and bound, for practicable farm purposes, are not worth the paper upon which the manuscript was written, and I concluded not to waste another cent for more farm books, but when I see that the Agricultural Epitomist recommends your book, I will try once more, and hope to be able from the contents to praise it to my farm friends here. I remit by American Express M. O. $1.25. Please send me a copy at once.

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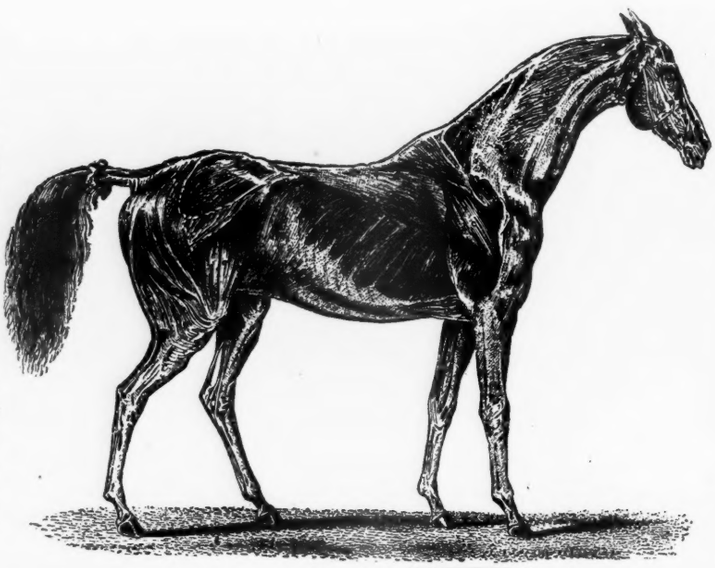

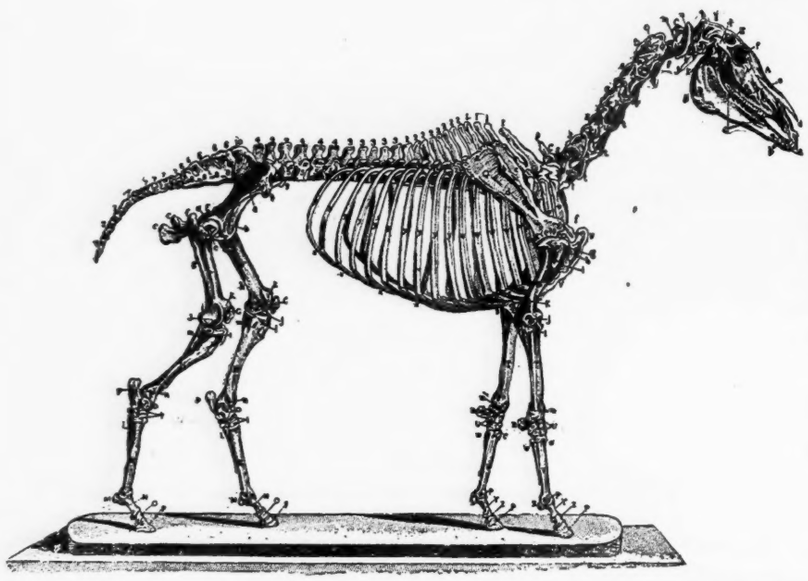

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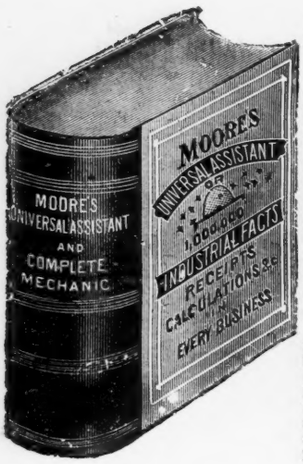

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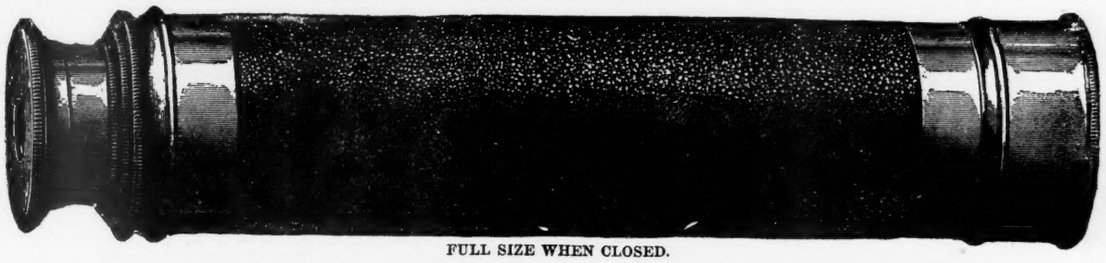

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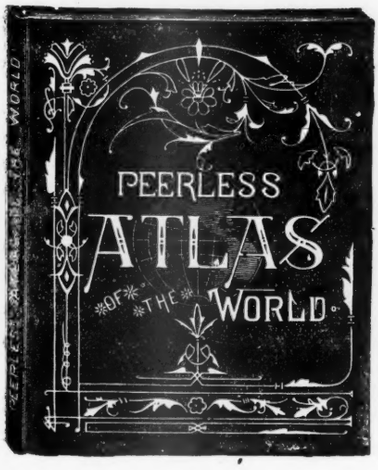

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